FLIGHT
and
AIRCRAFT ENGINEER

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The Outlook

The Defence Debate

THERE was little comfort to be derived from the debate on defence which the House of Commons held on September 23rd. Mr. A. V. Alexander, the Minister of Defence, said very little at very great length, and it was thus hardly surprising that his statement, to quote the correspondent of *The Times*, was greeted with "a cheer which hardly disturbed the silence."

In view of decision to rearm, and to overhaul mobilization machinery, one item in his speech *is* worth recording. In referring to the Five-Power Military Committee of the Western Union, he said that this had met regularly in London since May 5th, and that a great deal of work had been done in organizing the military resources of the Five Powers for our common defence. He added the information that the American and Canadian Chiefs of Staff have appointed representatives to attend as non-members. That is all to the good and should help to keep our friends across the Atlantic fully informed. The Chiefs of Staff of the Five Powers met in London on August 25th to review the work of the Military Committee, and their joint recommendations were being considered in Paris last Monday by the five Ministers of Defence. It is to be hoped that useful results of those deliberations will be achieved, although the public is not likely to be told any details.

As Mr. Eden pointed out, the United States does not hesitate to publish the numbers of men and aircraft which are her strength at present and the numbers it is hoped to add during the year. The Minister of Defence had said he thought it might be possible to give a little more information later, but Mr. Eden pointed out that nought plus nought is still nought. Which reminds us that we made exactly the same remark before the German war, when Sir Kingsley Wood announced that our aircraft production had doubled, or some such figure.

While no one would suggest that information should be disclosed which would otherwise be difficult for an enemy to obtain, the secrecy business can be overdone. As Brigadier Head said, the Minister of Defence can hardly imagine that Russia, with the number of fellow travellers she has, knows as little about our armed strength as do the Members of the House, and abuse of secrecy can be used as a screen behind which failure and maladministration can shelter.

One disturbing statement made by the Minister was that rearmament will not upset our economy. If that reflects the plans of the Government, the whole thing is futile. As Mr. Crossman said, rearmament "has got to hurt" if it is to be worth having as a diplomatic weapon.

The Royal Air Force

DEALING more specifically with the Royal Air Force, Mr. Eden called attention to the fact that the total strength of its personnel is 231,000, of which 131,000 are National Service men and women. When National Service was introduced, we pointed out that these short-term men (first it was to be 18 months and then the Government was bullied into making the period 12 months) would be of no manner of use to the R.A.F. except for menial tasks. No one, least of all a conscript who can have little real interest in a service which he has not joined voluntarily, can be expected to learn more than the rudiments of a highly skilled technical trade such as those which exist in the R.A.F. The Navy does not want these men, but the Navy can get all the volunteers it wants. No so the R.A.F., in which, Mr. Shinwell had to admit, "the position is very unsatisfactory indeed." He explained it by the fact that at the end of the war most of the regulars had served their engagement, many even their Reserve service, and that recruiting had not hitherto been on the same scale as before the war.

Mr. Shinwell, replying to speakers who had suggested higher pay, said he did not think that would improve matters, but that a better way was to improve conditions

in the Forces. Mr. Max Aitken did not agree, and he made the point that the R.A.F. must now be treated as an under-manned industry. He was referring particularly to such skilled men as technicians and instrument makers. These men were wanted by industry and by the R.A.F. Industry paid the higher wages and industry got the men.

The subject was followed up by Group Captain Wilcock, who took as his text the reserves which already exist in the form of men, a million of them, who served as pilots, navigators, air crews and mechanics. He made the very good point that although we have 1,000 pilots in the R.A.F.V.R., men who, three years ago, were flying operationally, they are now flying "tiny training machines—the same sort of thing which the boys and girls in the aero clubs are flying." He suggested that the Tempests which to-day are lying about on the ground should be made available to V.R. pilots, and also that useful training could be given to some of these V.R. pilots by giving them a chance to take part in the air lift to Berlin. There are obvious difficulties in adopting this suggestion, but it appears to merit consideration.

Accident Investigation

ONE of the subjects which Lord Nathan had under consideration before he left the Ministry of Civil Aviation was the present system of accident investigation. We submit that as soon as he has picked up the threads and can find time, the new Minister of Civil Aviation, Lord Pakenham, should give this matter his close attention.

In our issue of September 16th we published a letter from the Deputy Master of the Guild of Air Pilots and Air Navigators in which one particular air accident report was criticized. It was the accident which gave rise to the installation of speech-recording apparatus at airport controls, but that step, desirable as it undoubtedly is, is not sufficient in itself. The whole system in force is illogical.

Everyone who knows him and his work has the highest possible regard for, and confidence in, the present occupier of the post of Chief Inspector of Accidents, and no blame attaches to him personally. He is working the system as well as any man could within the existing framework. But it is fundamentally wrong that the Ministry of Civil Aviation should be the employer not only of the Chief Inspector of Accidents, but of the Airport Controllers, too, as well as being the overriding authority in relation to the three Corporations.

In fairness to all concerned, and especially to the pilots, the investigation of air accidents should be undertaken by an independent body, owing no sort of allegiance to the Ministry of Civil Aviation. As things are at present, the Ministry is prosecutor, judge and jury too.

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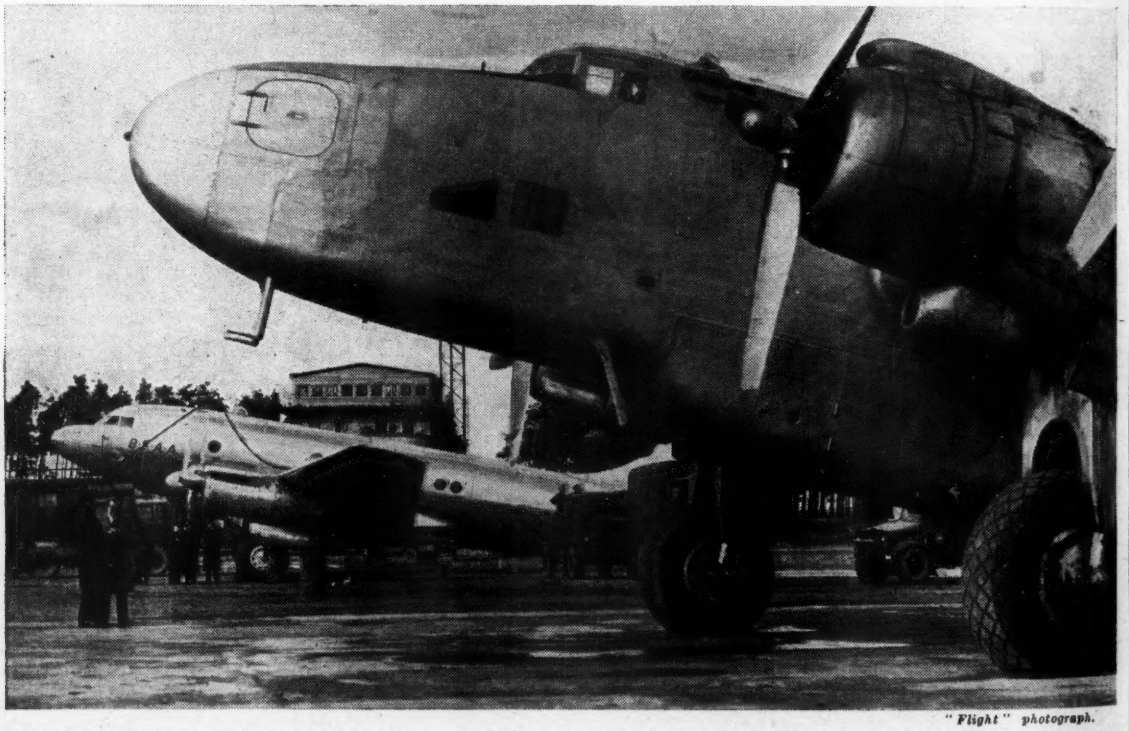
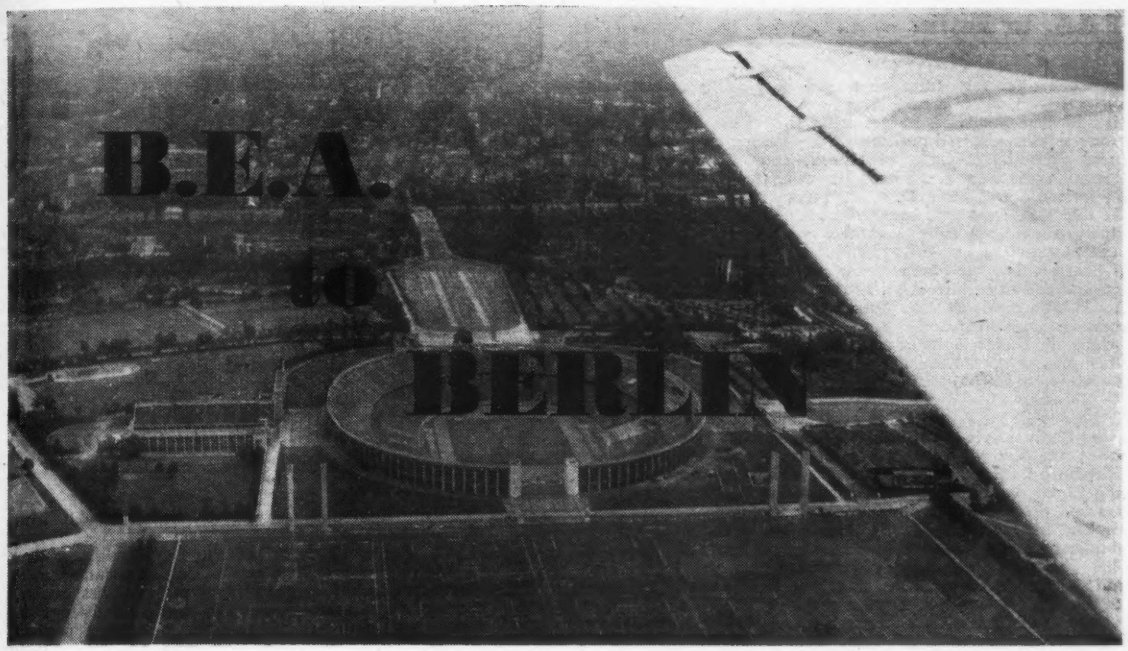


"Flight" photograph.

CIVIL AIR LIFT: An Avro Tudor I of B.S.A.A., flown out to Germany and operated on the Wunstorf-Gatow run by Captain Gordon Store, glimpsed under the nose of a Handley Page Halton freighter. Haltons are being operated with marked success on the Civil Air Lift to Berlin by Skyflights, Bond's Air Services and Eagle Aviation.



Part 1.—Scheduled Services and the Civil Air Lift : Methods and Results

By H. F. KING, M.B.E.

Illustrated with "Flight" Photographs

FACILITIES accorded by British European Airways enabled the writer and L. W. McLaren, *Flight* photographer, to spend two-and-a-half days last week in Germany. The primary aim of the trip was to record B.E.A. activities, with particular reference to the Civil Air Lift to Berlin as organized and operated by the German Area of the Corporation. In the event, it proved possible—thanks to the utmost co-operation of B.E.A. and the R.A.F.—to amass material for a far more comprehensive report than originally foreseen. This, it is felt, can best be set down in diary form, for a more formal narrative, lacking personal impressions, would convey a wholly inadequate picture.

Wednesday, September 22nd:

Via the newly opened Kensington Air Station, we were airborne from Northolt in Viking *Vicinity* at 0855 local time. Having covered the 463-mile leg to Hamburg at a ground speed of 205 m.p.h., height 7,000-9,000 ft, Captain Graham set us down to schedule on the jarring P.S.P. runway at Fuhlsbüttel Airport. From the restaurant (where twenty cigarettes and a bar of chocolate cost 1s 3d to those in transit, and a bottle of beer is to be had for a modest 6d), we saw an Airlinks Dove bearing the ubiquitous "Bata" legend, a blue Halton of Skyflights, and a Norwegian Airlines DC-3. Work on a 2,000-yd concrete runway is in progress.

Mr. E. P. Whitfield, B.E.A. Manager, Germany.

IN the next issue an account will be given of Flying Control at Gatow, of flights to and from Wunstorf and Lubeck in aircraft of the charter companies; and of encounters with Russian aircraft.

B.E.A. are general agents at Fuhlsbüttel for the Scandinavian Airlines System, K.L.M. and Sabena, and are thus responsible for bookings, airfield handling, transport, etc., for sixty scheduled, and eight optional, services each week. The Corporation itself maintains the London-Hamburg-Berlin Viking runs, and the London-Amsterdam-Copenhagen-Hamburg-Berlin freight services. S.A.S. operate Oslo-Copenhagen-Hamburg-Frankfurt-Zurich-Marseilles; K.L.M. and Sabena respectively fly Amsterdam-Hamburg and Stockholm-Hamburg-Brussels; and Sabena have a Brussels-Hamburg-Copenhagen service. Fuhlsbüttel, moreover, is an optional stop on the S.A.S. Oslo-Paris route. Thus some really useful business is being done.

Vicinity bore us on towards Berlin/Gatow in teeming rain and, being confined in the corridor to the "bottom layer" at 1,000 ft, suffered a severe bumping. Those passengers who observed it (many being preoccupied with internal instability) were more or less discomfited to

B.E.A. to Berlin . . . . .

notice the homely form of a R.A.F. Dakota materializing close to port out of a curtain of rain. (As we later discovered, it was some thousands of feet below the set height). Our wireless operator reported position when entering the Russian zone near Boizenburg, again at Kyritz, and a third time when twenty miles from the beacon at Frohnau. Over this beacon he switched to Gatow Tower frequency, and having reported at five miles and two miles, *Vicinity* took her place on the dusty airfield among dozens of workstained "Daks," Yorks and Skymasters.

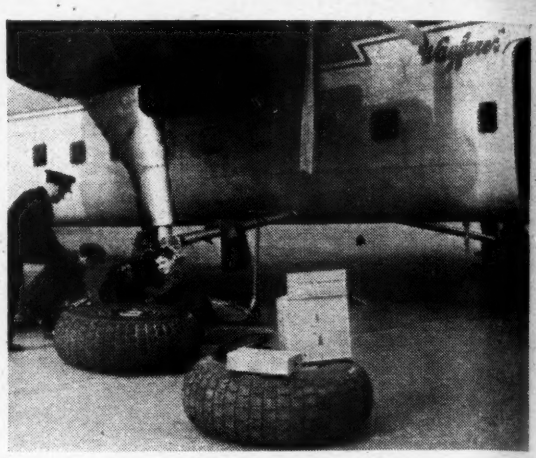
Scarcely had we glimpsed the astonishing scene of air and ground activity confronting us than we were conducted to Mr. E. P. Whitfield, B.E.A. Manager, Germany, who saw to it that we were adequately refreshed at his lakeside home (from which the Sunderlands and Hythes from Finkenwerder can be seen alighting on Lake Havel, two miles S.E. of the airfield) before returning to hear something of B.E.A. undertakings in Germany.

Throughout the period of crisis the regular London-Hamburg-Berlin service has been maintained. On July 4th, moreover, the Vikings on this run began to be employed on a Hamburg-Berlin shuttle service, for which any Germans holding Zonal passes are allowed to purchase tickets in Deutschmarks. Frau Schröder, Mayoress of Berlin, was a passenger on the inaugural flight. It is now the practice to provide duplicate crews for each Viking engaged, so that one crew flies London-Hamburg-Berlin-Hamburg, night-stops in Hamburg and completes another shuttle to Berlin before returning to Northolt. On five days a week a DC-3 freighter flies London-Amsterdam-Copenhagen-Hamburg-Berlin, returning to London via Hamburg.

Between August 5th and mid-day on September 25th there were 172 B.E.A. scheduled and charter flights to Berlin and the same number of departures.

Ticklish Jobs

B.E.A.'s Station Superintendent at Gatow is Mr. W. A. C. Emmett, and Mr. D. S. T. Bailey is Senior Traffic Officer. There are, in addition, three Britons and seventeen Germans. The problems now confronting the staff are unique in the history of British commercial flying. At the booking office in the Kurfurstendam Mr. H. Collis must satisfy high officials and commercial passengers alike, and maintain a balance between British and Germans. Racketeers, children, Quakers and domestic servants have all applied with varying success for seats on the Vikings. Since the start of the Hamburg shuttle service (which made 54 seats available daily instead of 27) more than ten enquiries—many of them deeply pathetic, others decidedly unsavoury or even criminal—have been received for each booking.



Wheel-change on a Wayfarer at Gatow.

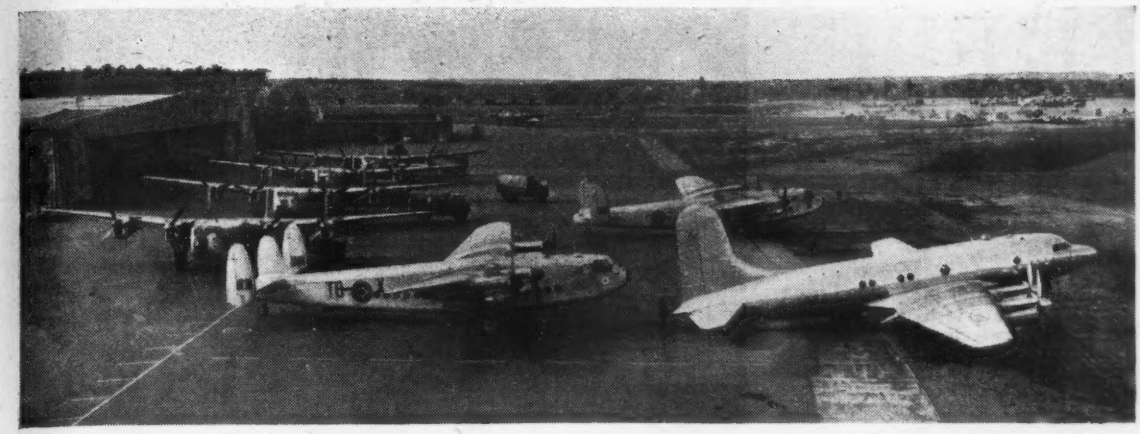
In general, it may be said that the DC-3 freighters have been bringing in raw materials and taking out manufactured goods, the latter including Telefunken radios, Zeiss cameras and door-locks, and pianos. To handle consignments for some 60 German agents and yet to maintain a flow of personal effects for Britons demands tact and judgment of no mean order. The carriage of Troop Mail started on September 7th, and two charter aircraft (Skyflights Haltons) have handled something like 419,000 lb of American "Care" parcels in 29 sorties, as a result of which a contract has been secured for transporting 216 additional tons of these packages. One aircraft is at the disposal of Hilfswerk, a German organization which collects relief supplies for the Berliners.

From Mr. Jack Cooper, Station Engineer at Gatow, we learnt that no refuelling takes place there, though the tanks of the Vikings are dipped and oil may be topped up. Further illustrative of B.E.A.'s determination to become self-supporting in the sorely-beset capital is the recent modification of Vikings "PR" and "PP" for the carriage of fuel for Corporation motor transport in specially sealed port and starboard nacelle tanks, the combined capacity of which is 100 gallons. Every week sufficient petrol is flown in for seven days' consumption. Again, when electricity cuts affected the B.E.A. town terminal, a generator was brought in without delay.

Thus is a public Corporation contributing, side-by-side with the charter operators, the R.A.F. and the U.S.A.F., to the sustenance of a weary and apprehensive, but not, be it said, hopeless city.

Fine a record as it is—though but briefly stated—the foregoing takes no account of the B.E.A. service operating from Frankfurt to Vienna, or of the long-term plans in hand for Hamburg - Frankfurt, Frankfurt-Berlin and London-Lohausen (Dusseldorf) routes. Regrettably, serious difficulties have been occasioned at Frankfurt by the American air lift. B.E.A. schedules have already been adjusted, but the "lift" blocks are not operating to a rigid time-

B.E.A. officers at Gatow: (l. to r.) Messrs Foster, Bailey, Emmett, Herbert, Black, Lewinden (from Hamburg) Mathieson, Cooper and Saul.



The B.S.A.A. Tudor I, a small group of R.A.F. Yorks, and a Flight Refuelling Lancastrian at Gatow. The tarmac is mysteriously depopulated.

table, and this consideration, together with the worsening weather, may soon render impracticable the use of Frankfurt.

Our next business at Gatow was to form a picture of the Civil Air Lift.

The first intimation received by Mr. Whitfield of the plan for augmenting the military "*Operation Plain Fare*" was advice, on Sunday, August 1st, that civilian charter aircraft might be sent out under his control. The following day, more details arrived; B.E.A. representatives were despatched to make preliminary arrangements, and on Wednesday the first aircraft landed. The civil lift started in earnest on August 5th, the fleet at that time consisting of nine Dakotas (from Air Contractors, Air Transport (Jersey), Ltd., Westminster Airways, Kearsley Airways, Scottish Aviation, and Trent Valley Aviation), a Hythe (Aquila Airways), a Liberator (Scottish Aviation) and a Halton (Bond's Air Services). Meanwhile, since July 27th, Flight Refuelling had been operating under separate contract three Lancastrians from Buckeburg, carrying M.T. petrol. On August 31st, this company joined the Civil Air Lift for operational and administrative purposes.

CIVIL CIRCUS

Things went amazingly well, and by September 21st, the civil fleet (sometimes known by the R.A.F. as "Whitfield's Circus) had doubled in size. Ciro's Aviation and the British Nederlands Co. contributed Dakotas; Silver City sent two Wayfarers; and Haltons arrived from Skyflights, Bond's Air Services and Eagle Aviation, together with a Tudor of Airflights, a second Hythe and a Viking of Transworld Air Charter.

The Dakotas operated between August 5th and 26th from Fassberg and during this period carried coal, but since having moved to Lübeck, on August 27th, their load has been flour. From Buckeburg, the Flight Refuelling Lancastrians transferred to Wunstorf, from which base the Haltons were already carrying flour and an occasional load of coal. The Hythes are operating on the Finkerwerder-Lake Harvel run, bearing food and miscellaneous loads, while the Wayfarers from Wunstorf are handling similar cargoes. The following figures for the "civil lift" speak for themselves and reflect the highest credit on the personnel and machines involved: *Sorties:* Dakota 1,011, Halton 172, Liberator 15, Hythe 140, Lancastrian 329, Tudor 49, Wayfarer 32, Viking 9. (Total 1,757). *Tonnage uplifted*: 7,109.8 tons of petrol, food, flour and miscellaneous cargo.

Captain Gordon Store, who is operating a B.S.A.A. Tudor I on the Civil Air Lift.

Not the least gratifying aspects of the operations have been the severance of red tape, the reduction of paper work and the recognition of gentlemen's agreements. Though the charter firms are responsible for bringing their own spares to Germany occasions arise when B.E.A. are requested to supply a part. Should this be available it is handed over; if lacking, the R.A.F. is approached; and, as a last resort, the item is flown in by the first available aircraft.

Mr. G. A. C. H. Foster, who, with Messrs. K. J. Mathieson, J. Herbert and C. Colman, is responsible at Gatow for B.E.A. air lift liaison, related for us the story of A.V-M. Bennett's Tudor II which arrived from Heathrow with an exhaust stub on one engine sprung open by heat. The time was 9 a.m. Five hours from touch-down the Tudor was in the air again with some first-class R.A.F. craftsmanship controlling the fiery exhalations of the Merlin.

Nor is the Service/civilian co-operation restricted to spares and running repairs, as witness the following: On hearing that civil Dakotas were to be based at Fassberg, Mr. Whitfield rang up to request a hangar for maintenance. Next morning, arriving at Fassberg, he was approached by a corporal with a request to sign below the entry "Hangars, one."

Any number of anecdotes were forthcoming concerning the charter crews, who are working themselves and their machines to the utmost of their endurance. One heard, for instance, of Captain Treen, of Bond's Air Services, who did six return trips in a Halton in 26 hours; of Dakota G-AKDT, of Kearsley Airways, which arrived at Fassberg *from the Far East* at 1800 hrs one evening, took off at 2116 hrs and did a return trip to Gatow; and of how an Air Vice-Marshal and Chief Executive—Don Bennett by name—rolled up his sleeves and got down to it with the chaps. (The A.V-M. had, regrettably, returned to England before we arrived, for a "major" on his Tudor II).

The deeds of the men are certainly matched by those of the machines. To facilitate loading, standardized cargoes have been agreed—7,500 lb for the Dakota (with special A.R.B. dispensation); Hythe, 11,592 lb; Liberator, 14,600 lb; Halton, 14,112 lb; Lancastrian, 10,800 lb (made up of 1,500 gallons of petrol; the capacity, of course, is greater but the aircraft is restricted by runway); Tudor II, over 20,000 lb; Wayfarer, 7,400 lb. In the present scheme of things a short turn-round time is vital—some 12 minutes for a Dakota ("record," 10 minutes); Tudor, 33 minutes; Wayfarer, 23 minutes; (Freighters with nose doors, are an urgent need); Halton 14 to 20 minutes; Flight Refuelling Lancastrian, 21 minutes.

All this we learned before adjourning late to the comparative peace of the Country Club, formerly the residence of Marshal of the Royal Air Force, Lord Douglas.

Thursday, September 23rd:

Throughout last night the drone and roar of engines persisted as cargoes of food came swiftly out of the darkness. Each York sounded like a flight of Mosquitoes, breaking our badly needed sleep, but the morning was fair consolation for a restless night, and as we drove on to Gatow airfield the sun glinted on the fuselage of a Tudor—a newcomer unexpected even by Mr. Whitfield. Inspection showed it to be a Tudor I of B.S.A.A., just arrived with 20,600 lb of bean flour. We soon sought out Captain Gordon Store, Chief Pilot of B.S.A.A., who said his machine—G-AGRJ—was one of three Mk I Tudors used by B.O.A.C. for training and now turned over to B.S.A.A.

From the Tudor we walked over to meet G/C. B. Yarde, Station Commander, R.A.F. Gatow, and W/C. T. W. Piper, Wing Commander, Flying. The group captain was emphatic that, notwithstanding its amazing effort, Gatow is not working nearly up to capacity. More and bigger aircraft are needed, and the Hastings, for which crews are training in England, will be a godsend. Due consideration we were assured, has been given to free dropping and the employment of towed gliders.

(To be continued)

HERE AND THERE

Australia's Bristol Freighter Plans

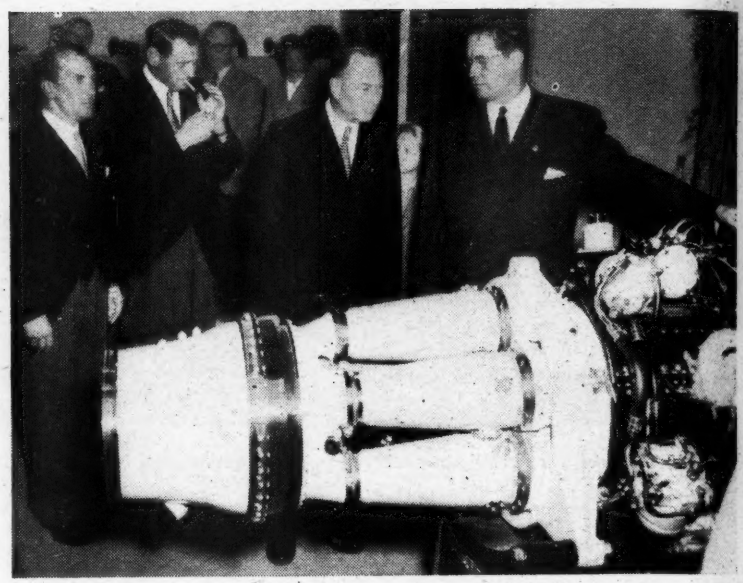
PLANS are said to be well advanced for the production of Bristol New Type 170 Freighters in Australia; it is probable that the construction will take place at the Beaufort Division factory at Fisherman's Bend, Melbourne. The programme envisages production of ten aircraft for the R.A.A.F., as a start, though it is expected that further orders will follow the initial one.

British Firms at Oslo

THREE British aviation firms exhibited at the Flying Week and Air Exhibition at Oslo from September 6th to 18th; they were, de Havillands, Dunlops, and Sponson Developments, Ltd. The last-named company took the opportunity of studying operational conditions for amphibious aircraft in Norway. The studies proved that such a type of aircraft is very suitable for the typical Norwegian mountain terrain with its many small lakes. Plans are in hand to produce amphibians in Norway using Norwegian materials and capital. Broch and Bergaust, of Oslo, have been appointed agents for Sponson Developments, Ltd.

London-Paris Relay

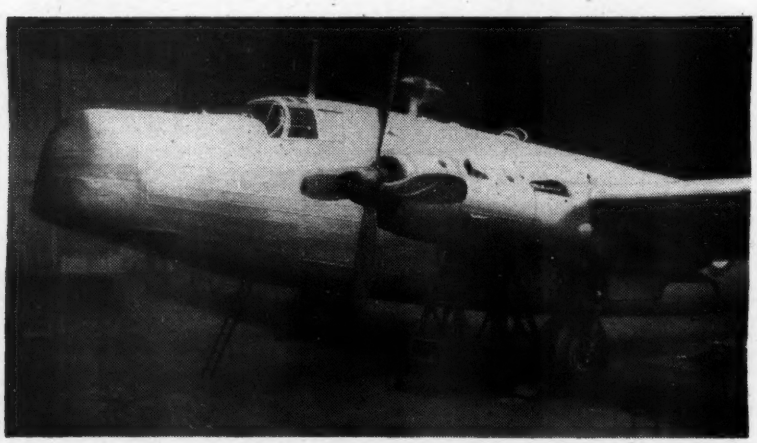
TO demonstrate the practicability of taking off from the centre of London and landing in the centre of Paris in an hour, three aircraft companies have collaborated to make a relay flight this morning, September 30th, between the two cities. The arrangements were for a Bristol 171 helicopter, piloted by Mr. E. A. Swiss, to take off from a bombed site near St. Pauls carrying a message from the Lord Mayor of London addressed to M. Pierre de Gaulle, President of the Municipality of Paris. Waiting at Biggin Hill, S/L. Waterton arranged to take the message across to Orly in a Meteor, there to hand it to Mr. Alan Bristow for the last leg of the flight in a Westland Sikorsky S-51 helicopter.



ROYAL INTEREST: H.M. King Frederick of Denmark (second from left) formally opened the British Trade Fair in Copenhagen on Sept. 18th. He is here seen with H.R.H. the Duke of Gloucester, representing H.M. King George VI, examining the Armstrong Siddeley Mamba airscrew turbine.

U.S. Helicopter Industry Tour

MR. C. COLIN COOPER, who since leaving the sales department of Bristol's in 1947 has undertaken privately various helicopter researches, recently left England on a two months' tour of the American helicopter industry. At the conclusion of this tour Mr. Cooper hopes to furnish the Helicopter Association of Great Britain with a considerable amount of general information and films, in order to assist the Association in the formation of its reference and film library.



PROP-JET WIMPEY: An exclusive photograph of the Vickers-Armstrongs Wellington which has been fitted experimentally with two Rolls-Royce Dart airscrew turbines as a flying test-bed for the power plant installation of the Viscount.

U.S. Jet Bomber

IT is reported that a North American B-45 jet bomber, from the U.S.A.F. experimental base at Muroc, blew up and crashed on September 20th while on a training flight over California, and that all on board were killed. The B-45, two versions of which are in production for the U.S.A.F., was the first American heavy jet bomber to fly. A crew of four is normally carried, and four General Electric TG-190 turbojets in paired nacelles give a speed above 500 m.p.h.

D.H. Propellers' Appointments

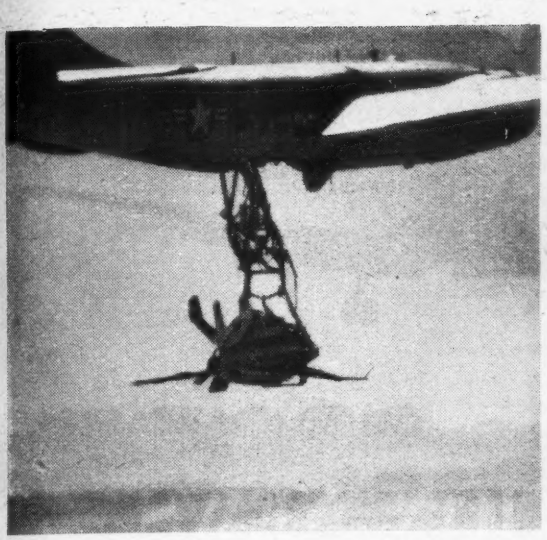
IN order to strengthen the technical organization of de Havilland Propellers, Ltd., Mr. G. C. I. Gardiner, lately chief designer, has been appointed chief engineer of the company. This is to enable him to devote more time to future trends in airscrew design. The development and the design departments have now been combined under Mr. D. B. Russell, chief designer.

Secretarial Luncheon

GUEST of honour at a luncheon given by the Institute of Secretaries on September 23rd was Mr. J. Davison, O.B.E., managing director of the de Havilland Aircraft Company of South Africa, who is also chairman of the South African branch of the Institute. Mr. Davison brought with him a solid gold inkwell, standing on a block of South African gold-bearing reef—a gift from the South African branch to headquarters in London.

Exports of Super Aces

AS a result of negotiations between the Chrislea Aircraft Co., Ltd., and Casa Iturrat of Buenos Aires, the latter firm will in future import only Super Ace aircraft. During the past twelve months Casa Iturrat have imported into the Argentine 92 light aircraft of American manufacture. The first two Super Aces



TRAPEZE ACT: The MacDonnell XF-85 Parasite fighter in two stages of departure from its parent B-29 Superfortress, which was specially modified for the recent flight trials. The aptly named Parasite is intended for stowage aboard the Consolidated B-36A as part of its defence system. The technique used in releasing and "re-hooking" the Parasite is similar to that employed by pre-war fighter-carrying dirigibles of the U.S. Navy. Performance figures are not available, but the designed speed is in the 600 m.p.h. region with a Westinghouse J-34 axial-flow turbojet (3,000 lb. thrust) installed.

HERE AND THERE

are now on their way to Buenos Aires and negotiations for a further 24 are expected to be completed in the next few weeks. Chrislea's also expect to conclude selling agreements with India and Uruguay in the near future. The first two Super Aces for Rhodesia will be flown there shortly. The company's recent demonstrations in Europe were rewarded by selling 10 machines to Denmark; Holland and Sweden are also actively interested.

Model Meeting at Honeybourne

EVESHAM MODEL FLYING CLUB held its first meeting on September 19th at Honeybourne airfield; members of several neighbouring clubs, including Gloucester and Birmingham, attended. Although the weather was fine the wind was rather strong for model flying, in consequence of which many machines suffered mishaps of varying severity; many also were carried far beyond the airfield boundaries hotly pursued by their owners. The control-line flying contest was the most spectacular event of the afternoon. The excellent performance of the biplane designed and built by Eric Wiggle of the Cheltenham M.F.C. won first prize for him, most points being awarded for his very neatly executed loops. Second place was taken by "Johnny" Johnson whose diesel engined monoplane was equally at home in both normal and inverted flight.

News in Brief

More than 17,000 transatlantic crossings have been completed by American Overseas Airlines since June, 1942, when the company began its transatlantic services.

* * *

Grouse shot in Scotland have recently been flown to New York by B.O.A.C., where they are earning dollars in the fashionable restaurants and clubs there. The game was sent by rail to Euston and reached New York within 48 hours of being shot.

* * *

Officials of the B.E.A. helicopter unit at Peterborough recently visited Chance Brothers, Ltd., by helicopter. They landed on the works football pitch where they were met by the sales manager. The purpose of the visit was to discuss with the manufacturers details of landing beacons.

* * *

Of the aircraft flown during the Farnborough display 87 per cent were equipped with Dunlop wheels, tyres, brakes and brake operating gear; all the Service aircraft were fitted with Dunlop gun-firing equipment.

* * *

The de Havilland Goblin which recently completed the tests simulating fighter aircraft combat conditions was equipped with a Hymatic air compressor of the SH6/2A type; adopted as standard on British aircraft engines since 1940, its working pressure is 450 lb sq in.

Lieut. Gen. Curtis LeMay, Commander of the U.S. Air Forces in Europe, has been appointed Commanding General of the Strategic Air Command in place of General G. C. Kenny, who has been appointed to command the air university at the Maxwell Base at Montgomery, Alabama.

* * *

Thomas F. Laurie will take up a new appointment as chairman of the Irish-American Oil Co. at the end of this year. In 1922 Mr. Laurie was entrusted with the formation of the Irish-American Oil Co., of which he became managing director in 1931. He worked on the Petroleum Board during the war.

* * *

A B.S.A.A. Tudor I, adapted for freight carrying, joined the Berlin air lift on September 22nd. It is being operated by a B.S.A.A. crew and is expected to remain on this service for a considerable period if necessary; a second aircraft of the same type is expected to join the Berlin run shortly.

* * *

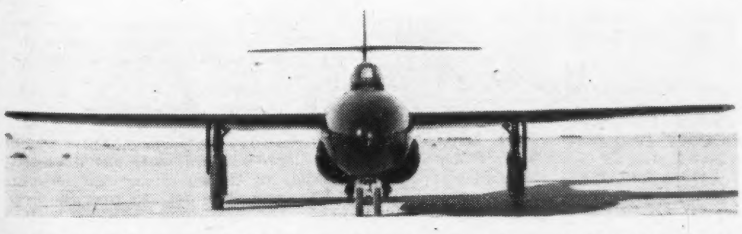
It is reported from Washington that President Truman has approved the purchase of a further 100 Lockheed Shooting Star F-80 C fighters for the U.S.A.F. This makes up present orders for these aircraft to nearly 600; six of America's eight fighter groups are now equipped with Shooting Stars, of which type Lockheeds have built over 1,000 machines.

* * *

In reply to a question put by W/C. W. J. Hulbert (Cons., Stockport) in the House of Commons recently, Mr. C. P. Mayhew, Under-Secretary of the Foreign Office, stated that the additional cost to the Exchequer of supplying food and fuel to Berlin was approximately £1,000,000 up to August 31st. The operations, he said, had involved additional consumption of about 9,000 tons of petrol up to September 16th.

* * *

Organized by the Industrial Sales Division of Kodak, Ltd., the exhibition "Photography in Industry and Commerce" is at present making a tour of the country. It will be visiting Liverpool between October 4th and 8th; Nottingham, October 18th-20th; Cardiff, November 1st-5th; Cambridge, November 15th-19th. Tickets may be obtained from Kodak, Ltd., Kingsway, W.C.2.



AMERICAN ALL-WEATHER FIGHTER. The Northrop XF-89, which won first prize in a recent U.S.A.F. design competition. The machine, which is now undergoing flight tests at Muroc, is very fully equipped with radar instruments and carries pilot and radar observer in a pressurized cockpit. The thin wing and high-pressure tyres will be noted. Gross weight is more than 30,000 lb. Two machines have been ordered. The jets are TG 180s or 190s.

CIVIL AVIATION NEWS

DUTCH CONVAIR: K.L.M. crews are now undergoing conversion flying at Schiphol Airport in preparation for operating Convair 240 aircraft on their Continental routes. Operations with this type are expected to begin next January when at least six Convairs should have been delivered. The conversion training programme now being carried out with the first two Convairs to be delivered to the Dutch airline will probably include familiarization flights to London Airport.

I.A.T.A. Conference Ends : Plessey Lightweight V.H.F. Radio : Airlines to Pay for Icelandic Aids

SIR MILES THOMAS' ASSIGNMENT

B.O.A.C. have announced that Sir Miles Thomas, deputy chairman of the Corporation, on September 24th assumed responsibility for carrying through B.O.A.C.'s new plans for reorganization, details of which were given in *Flight*, July 29th. In view of the heavy responsibilities of the Corporation's chief executive, Mr. Whitney Straight, arising from the new aircraft programme, the board has decided that Sir Miles should take over these reorganization duties. When Sir Miles' appointment as deputy chairman was announced last April, the Minister of Civil Aviation described this appointment as being specially responsible for advice on questions of organization and on problems connected with the Empire routes of B.O.A.C.

AMBASSADOR ORDER SIGNED

ON behalf of British European Airways the Ministry of Supply on September 23rd signed a contract with Airspeed Ltd. for 20 Ambassadors, powered by Bristol Centaurus engines. They should be in operation during 1952 on the continental routes of B.E.A. as replacements for the Vickers Vikings now in service. So far two prototype Ambassadors have been completed, and production of the 20 ordered for B.E.A. has already begun.

Designed for economical operation and medium-stage air routes, the Ambassador has a very wide range of cruising speeds—195 to 312 m.p.h.—and at an all-up weight of 52,000lb it can fly a distance of 1,750 statute miles.

I.A.T.A. SUMMING UP

THE Fourth Annual General Meeting of I.A.T.A. closed on September 18th, and it was said to be in many ways the best and most constructive annual meeting yet held. In a joint statement, the President, M. Gilbert Perier, and the Director-General, Sir William Hildred; declared that their efforts had been concentrated upon reviewing the continuing activities of I.A.T.A. and approving future plans and projects. The Meeting had provided funds for the continuation of the I.A.T.A. Technical Conference, for further work in preparing joint tariffs and manuals of various kinds to simplify the work of all airlines, and for the continued development of the Clearing House. The Meeting had also approved the continued participation of the Association's delegations in future I.C.A.O. conferences in order that governments could have the practical counsel of the airlines.

The formation of a small expert panel of airline technicians to study air traffic control and navigation aids was agreed, and in view of competition from non-scheduled airlines it was suggested to the Traffic Conference that the airlines should observe the Government approved rate structure which protected both airlines and the public from cut-throat fare competition. It was also suggested that the possibility of second-class service at lower rates should be studied. A campaign against unnecessary customs and immigration "red tape" was to be intensified, and members were requested to urge their governments to ratify the Convention on International Recognition of Rights in Aircraft. The meeting also considered air mail matters, and indicated its desire for the transportation of mail by air without surcharge.

Finally, the meeting called for increasingly intensive efforts by I.A.T.A. to make air transport better and cheaper by simplifying, standardizing and unifying every possible phase of operations, although it meant a greater load of work on the organization during the coming year. An increase in the budget would not, however, be necessary since the number of members had grown, and because the dues paid were based on gross revenues, and I.A.T.A. was now costing the airlines less than ever before. The saving to the airlines by the Clearing House, quoted in *Flight* of Septemer 23rd, should have read £7,500 instead of £7½ million, and the losses covered in the devaluation of the French franc should have read more than £30,000 instead of £30 million.

ITALIAN ATLANTIC PROJECT

THE Advisory Committee for Civil Aviation in Italy, which is responsible to the Italian Government, has discussed the possibility of establishing an Italian air service between Rome and New York. The committee decided that the first prerequisite to such a service was the merger of several Italian airlines, including Alitalia, L.A.I., and S.I.S.A., all of which fly international services from Italy. Only Alitalia is at present flying overseas, however, using Avro Lancastrians, to Argentina. The committee also decided that only a Government-operated airline would be in a position to compete on the North Atlantic route, and since the most suitable aircraft

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for long haul ocean services were thought to be American, it was considered impossible for a private Italian airline to purchase a sufficient number to fly regular services. The project has therefore been abandoned for about two years.

BRITISH ROAD SURVEY

AMONGST contracts obtained recently by Hunting Aerosurveys, Ltd., is a survey for the Ministry of Transport to discover the most suitable alignment for projected trunk routes from Slough to Avebury, Sheffield to Leeds and Warrington to Lancaster. Photography of 190 running miles, and the addition of contours at 10ft vertical intervals to the existing ordnance survey maps, is entailed. Photography of several areas in Cyprus on behalf of the two leading mining companies in the island and similar work in Greece is in hand. The company are also engaged in preparing a series of maps of Ecuador for the Anglo-Ecuadorian Oilfields, Ltd. Aerofotos Limitada, a Columbian air survey company associated with Hunting Aerosurveys, was responsible for the photography and the film has been sent to the U.K. for mapping.

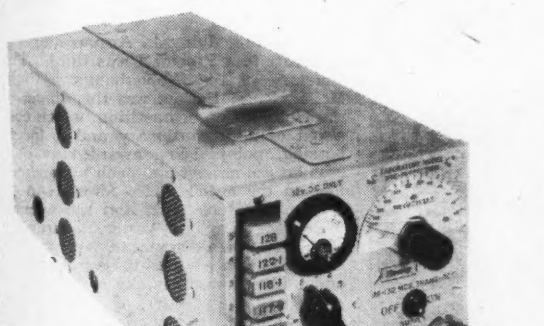
CONSTELLATION FREIGHTER

LOCKHEEDS have issued details of a freighter version of the Constellation being built for the United States Air Force and designated the C-121-A. The aircraft has been designed to carry, over a long range, personnel, cargo, sick and wounded or specialized detachable units. The floor has been stressed to carry loads up to 250 lb/sq ft, and a large door 109 in by 72 in is hinged from the top and opens outwards. Total capacity is 2,844 cu ft, made up of 2,480 cu ft in the main cabin and 364 cu ft in compartments under the floor. For carrying detachable cargo a development of the Speedpak provides additional cargo space of 400 cu ft, and an even larger one is being developed for carrying units with a gross weight up to 10,000 lb. The all-up weight of the C.121-A is 105,000 lb, and carrying 8,700 lb of payload can fly 4,000 miles with reserve fuel for 800 miles. At take-off weight and flying with normal rated power at 20,000 ft, speed is estimated at 338 m.p.h.

LIGHT AIRCRAFT RADIO

THE Plessey Co., Ltd., of Ilford, Essex, have developed a five-channel light-weight V.H.F. transmitter-receiver for light aircraft to meet all the expected official regulations for two-way radio communication. The set, to be known as the TR 51, has a frequency range of 116-132 Mc/s, the five channels within the band being made available by plugging in appropriate crystals. Receiver tuning is adjustable by a single knob, and the crystal controlling the transmitter can be used to calibrate it. Remote operated press-to-transmit facilities and electro-magnetic phones, are provided, while the receiver audio provides intercom for two stations.

A light-weight M.F. Broadcast and H.F. receiver with simple D.F. facilities on M.F. and Broadcast, combined with a H.F. transmitter, has also been developed as a companion set to the V.H.F. transmitter-receiver. This is the TR 52, and is said to provide all communication and navigational facilities essential to a light aircraft flying anywhere in the world. Three frequency bands are provided: 144 Kc/s—440 Kc/s, 496 Kc/s—1,500 Kc/s and 2.4 Mc/s—8 Mc/s. D.F. navigational facilities are also provided on the 144-440 Kc/s and 496—1,500 Kc/s bands by means of a screened rotating loop aerial, permitting bearings to be obtained on broadcasting stations or radio ranges. The same microphone and telephones are used in this set as in the TR 51 and a mixing box enables listening to be carried out on either or on both at once. Special attention has been paid to weight and size, and the TR 51 weighs only 9½ lb complete, while the TR 52 weighs 10 lb and 2 lb for the loop. Dimensions of each set are 5 in high by 6 in wide by 12½ in long. The TR 51 consumes 46 watts and on the TR 52, 34 watts.



LIGHTWEIGHT: Five channel V.H.F. transmitter-receiver type TR 51, developed by the Plessey Co., Ltd. for private and light charter aircraft. Channels can be changed by rotating two controls on the front panel.

ATLANTIC NAVIGATION AGREEMENT

DISCUSSIONS which were initiated at Geneva in June on the subject of maintenance of traffic control, radio communications and meteorological services in Iceland, mentioned in *Flight* of June 17th, 1948, have resulted in an agreement between I.C.A.O. and the Government of Iceland. Air navigation facilities and services in Iceland necessary for the safe operation of transatlantic air traffic will be financed internationally. By the agreement Iceland will receive 7,500,000 kronur, equivalent to £250,000, for expenses incurred in maintaining weather reporting and forecasting stations, air traffic control and a telecommunication network from 1946 until the end of this year. As from January 1st, 1949, however, ten nations, including Iceland, will defray the costs of such services up to a maximum of about £165,000. The Icelandic agreement is the third joint support arrangement concluded by I.C.A.O. to promote safety and regularity in the air.

BREVITIES

Sir Frank Whittle, honorary adviser on development and operation of gas turbine propulsion to B.O.A.C., is in Canada to lecture to the North-Western Canada Aviation Planning Council on jet propulsion. He will also visit the Boeing factory and will return to England on October 5th.

* * *

On the occasion of the Sabena anniversary at Lympne on September 17th, officials from the Ministry of Civil Aviation in London flew from Gatwick in two Miles Geminis. It is understood that these aircraft are maintained in the M.C.A. flight at Gatwick as part of the fleet responsible for testing and calibrating M.C.A. equipment, for passing-out pilots on test for licences, and for inter-departmental travel for officials.

* * *

Further to the announcement in *Flight* of August 12th that Qantas Empire Airways and the Australian Civil Aviation Department were interested in the possibilities of a service between Australia and South Africa, it is understood that a Q.E.A. Lancastrian will survey the route early in November. Already, it is said that one flight a month is planned along a route from Perth through the Cocos Islands, Mauritius, Seychelles, Mombasa, Castel Benito, London, and another, for which South African agreement would be necessary, branching off from Mauritius to Johannesburg, and from there by B.O.A.C. to London.

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Through Notice to Airmen No. 326 an amendment to Article 10 of the Air Navigation (Consolidation) Order, 1923, and a new Article No. 25A have been made. The new article lays down that an aircraft registered outside the U.K., if carrying passengers for hire or reward, shall not take on board or discharge passengers or goods within the U.K. except under the terms of any agreement in force at that time between the U.K. and the state in which the aircraft is registered, or by special permission. The amended Article 10 empowers an authorized person to detain an aircraft where it appears to him intended or likely to be flown in contravention of the above provisions. An attempt was made to amend this amendment by a prayer in the House of Commons on September 20th. After a lively debate, however, the amendment was defeated.

* * *

Air France winter services involve the suspension of a number of summer schedules to Paris and the Riviera. Services will be withdrawn progressively throughout October until by the end of the month there will be only three services daily between Paris and London, and the services to Nice will be reduced to two from nine a week. The daily service to Caen, under charter by Air Transport of Lille, will be carried on

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indefinitely, and the new service to Barcelona, which has been re-established after more than ten years, will be run twice a week throughout winter. As from October 3rd, the Manchester and Glasgow services will be combined to fly three times a week Paris-Manchester-Glasgow and return.

* * *

In the course of ordinary test flying, the Vickers Viscount was taken on September 20th to Villacoublay, Paris, at the request of the Ministry of Civil Aviation. Already this aircraft has flown to many parts of the U.K., and it is unique that a prototype should land on the Continent in its fully furnished condition, so soon after its first flight.

* * *

Two of B.O.A.C.'s York aircraft were stripped of furnishings at Karachi, and left on September 10th for Hakimpet to evacuate Europeans from Hyderabad. The two aircraft flew six runs between Hyderabad and Madras, carrying 133 people.

* * *

Trans-Canada Airlines have fallen in with the other airlines operating across the North Atlantic by introducing an excursion ticket between London and Montreal based on a single fare plus one-third, and valid for thirty days.

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For training pilots and other air crew in flight conditions, a synthetic trainer has been designed and built by Dr. A. C. Dehmel, chief engineer of the Curtiss Wright Corporation's electronic division. The trainer has been constructed on the lines of a Stratocruiser flight deck, and all hazards and effects can be reproduced.

* * *

Since its foundation in 1946, Aer Lingus has carried over 400,000 passengers. Between January 1st and September 4th this year Aer Lingus carried 132,444 passengers, which surpasses their previous highest passenger total for a year of 132,416 in 1947.

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A fortnightly service from Malta to Benghazi via Tripoli has been introduced by Air Malta, Ltd. The route is believed to be preferable to that through El Adem in view of the long and tiring coast journey from there to Benghazi.

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Air-India International's first additional service on the London-Geneva-Cairo-Bombay route, mentioned in *Flight*, August 19th, left Bombay on September 24th. The complementary east-bound service left London Airport on September 27th, so stepping up schedules to three a fortnight. With the introduction of winter schedules on November 1st, the frequency will be increased to two services a week in each direction, and until March 1st, 1949, Cairo will be the only stopping place. Geneva will not be served during the winter months, and Basrah will no longer be used as a refuelling stop on the west-bound flights. Lapsed time will be 23 hours between London and Bombay.

The company have operated at 100 per cent regularity since the inauguration flight in June.

FROM THE CLUBS

MAINLY due to the improved weather in July the Strathtay Aero Club logged 120 hours flying in that month but in August the figure fell to half the July total. One of the junior members, J. Johnston, took his first solo after seven hours of dual instruction. Fourteen new pilot members have joined the club recently, one of whom owns a Westland Widgeon; there are five new associate members.

* * *

MEMBERS can be accepted for the Thames Valley Flying Group, which will shortly begin operations from White Waltham airfield. The object of the group is to fly a Chilton on a joint ownership basis, an entrance fee or "share" being £20. By this means it is hoped to keep the cost of flying below £1 per hour. Those interested should get in touch with David F. Ogilvy, Hon. Secretary, Thames Valley Flying Group, at 9, Imperial Road, Windsor, Berks.

* * *

ON Saturday, October 2nd, the Wiltshire School of Flying will be "At Home" to all flying clubs; on this occasion the prizes awarded in the recent Thruxton Air Races will be presented. The day's programme includes an unofficial handicap race to Totland Bay and back for which a silver cup is to be presented to the winner by the Wiltshire Club; the entry fee is 10s. All entrants must be members of the Wiltshire Club and therefore those who wish to enter should notify the organizers without delay so that they can be elected honorary members for the day. The club bar will be open from 6 p.m. until midnight and overnight accommodation can be arranged.

* * *

ON the occasion of the Wolverhampton Aero Club's "At Home" on September 11th, they were fortunate in having good weather. Included in the day's programme was a navigation competition, covering a distance of 100 miles, in which there were three turning points. At each point a Roman numeral was displayed, the number being changed at frequent intervals. The winner of the event was the competitor who completed the course in the time nearest to the one computed by the judges, and also collected the correct numerals along the route. Seventeen aircraft took part and one of the club's younger members, Mr. A. Bickley, flying a Piper Cub, was the winner. His time was within 55 seconds of the official figure and he successfully located all the turning points. Second place was taken by Dr. A. B. Quinn, flying an Auster, and Mr. R. Pyatt in a Proctor I was third. The secretary of the Wolverhampton Club, Mr. L. E. T. Barley, was the winner of the Hobson Cup competition, which consisted of a precautionary and a forced landing, points being awarded in each case for the nearest approach to a defined line on the airfield. No fewer than 33 competitors took part, and the winner, who was flying an Auster, returned a score based on a distance of 32ft from the defined line on his precautionary landing, and in the forced landing a distance of only 3ft. An Auster also came into second place, piloted by Mr. R. A. Walley, with Mr. W. E. Crook, flying a Magister, third. Members and guests totalled over 500 at this function, which was completed by an excellent performance of aerobatics by the C.F.I., F/L. S. Robinson, A.F.C., and a demonstration of the Goodyear Duck, piloted by the president, A. Cdre. J. Oliver, A.F.C.

As frequently happens on such occasions, an excellent party developed in the club house during the evening.

FLYING VISIT: Arrangements were recently made for members of the Wolverhampton Aero Club to pay a visit to the Vauxhall Motors plant at Luton. Over a dozen aircraft put down at Luton Municipal Airport and the occupants were taken by Bedford coaches for their tour of the Vauxhall factory. After looking over the works the visitors returned by air to Wolverhampton.

MINIATURE MAMMOTH

THE flight-testing of piloted model aircraft, with a view to determining characteristics of full-scale machines of similar design, is not new. In this country valuable data were derived from trials with a scale replica of the Short Stirling bomber and of a projected four-engined Saro flying boat. Now, from France, come the accompanying views of the SE1210, the scale-model precursor of the SE1200 transatlantic flying boat. Designed for an all-up weight of more than 308,000 lb, the SE1200 will be powered by eight Arsenal 24H engines (4,000 h.p. each) or with the same number of Armstrong Siddeley Python turboprops.

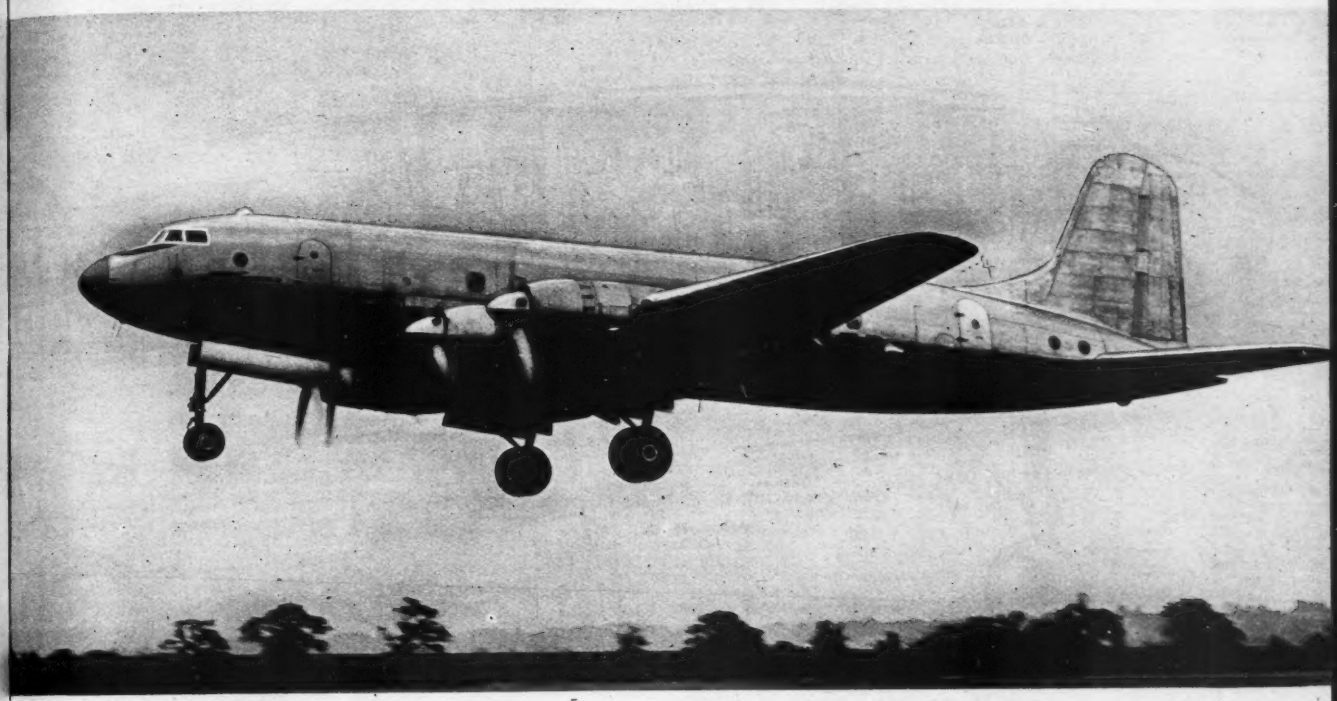
The model is of wooden construction and has been flown very successfully by M. Lecarme, chief test pilot of S.N.C.A.S.E. Four Renault 6Q engines are fitted (the nacelles, of course, are not to scale), and the wing-tip floats are retractable, as on the full-size aircraft.

BOMBER SALUTE

THAT the weather for the Battle of Britain Fly-Past by the R.A.F., R.Aux.A.F., Naval Aviation and the U.S.A.F., on September 15th, was far from favourable for an event of this kind will have been evident from the first-hand account, by a passenger in a Lincoln, published in the preceding issue. Despite this handicap, however, our photographer, who flew in Lincoln LSD-"Dog" of a Wyton squadron, managed to secure the accompanying pictorial records.

Every Londoner will quickly recognize the locality in the lower left-hand view, with the Strand and Aldwych prominent in the foreground, but the photographer confesses that he has quite forgotten the position of the formation when he pressed the button for the companion shot. The river, or canal, and the portion of a stadium visible in the top-left corner, offer clues which will doubtless permit instant identification by many readers.

As recompense for his lapse, the operator concerned produced the heading picture which, we think, conveys a striking and vividly true impression of the sort of weather met over much of England on that—and far too many other days of this year.



HERMES IV

A First-Class Modern British Airliner for B.O.A.C. : Outstanding Operational Versatility

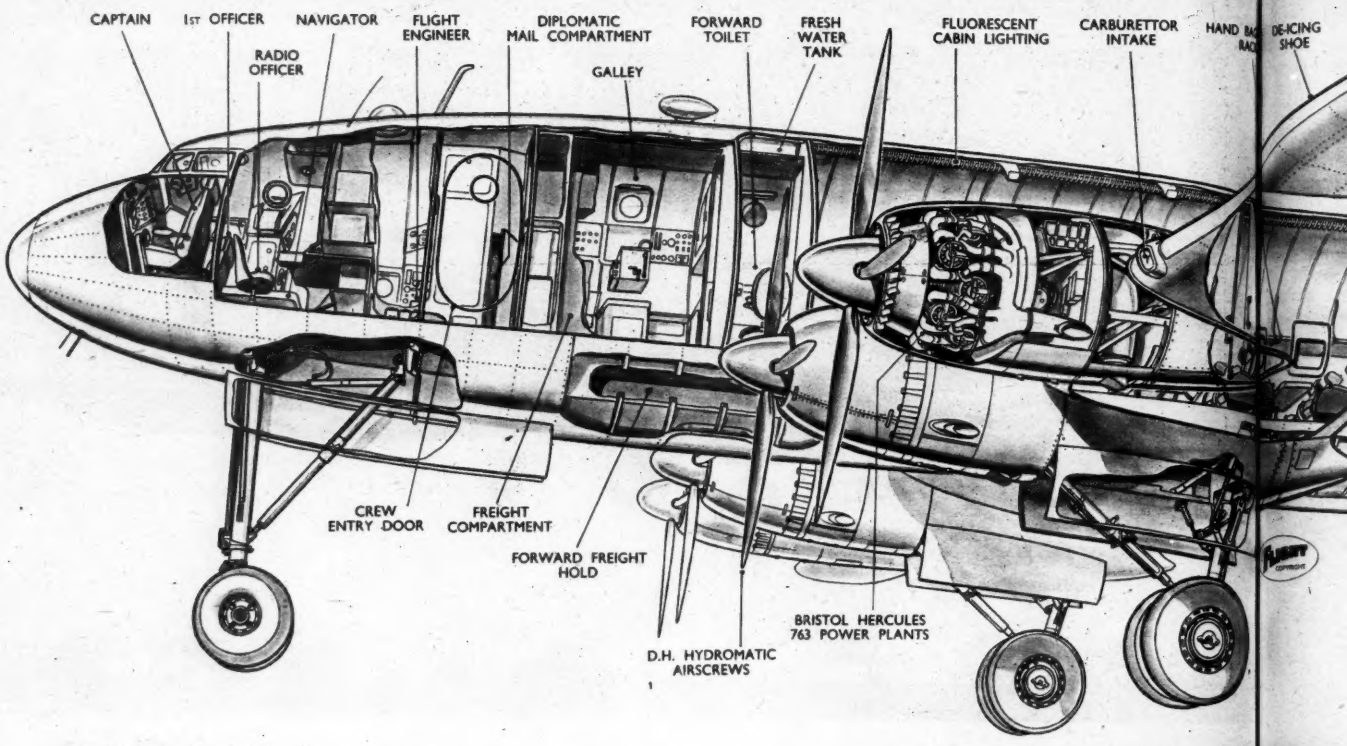
THE last pre-war civil aircraft made by Handley Page, Ltd., were the famous H.P. 42 Hannibal class, used for so many years and with such great success by Imperial Airways. These aircraft established a high standard of comfort in British airline travel, and there is every reason to hope that the new Handley Page civil airliner, the Hermes IV, will, in the hands of B.O.A.C., the successors of Imperial Airways, maintain that tradition, and at three times the speed. (Of the Hannibal it was once said that it was "as steady as the Rock of Gibraltar—and nearly as fast.")

Although the new Hermes is designated Mk. IV, it is, in fact, the first production model of its line. The Hermes I was the victim of an unfortunate crash, and the Hermes II, which came after, was a purely experimental aircraft to Ministry contract. The Hastings is, of course, the renowned military version of the Hermes II. The Hermes III was to have been a Mk. II, but powered by Theseus turboprops; this, however, did not get beyond the design stage. Now comes the Mk. IV, which, although we have heard it glibly and unjustly dismissed as a Mk. II with a tricycle undercarriage, is, in point of fact, virtually a brand-new aircraft. Both the Mk. II and Mk. IV versions of the Hermes are 16oin longer than the Hastings, but, whereas in the Mk. II this amount was split equally fore and aft of the wing, in the Mk. IV it is divided as 6oin increased length forward of the wing and 1ooin aft. This was determined for balance reasons, as B.O.A.C. required the galley to be positioned in the forward part of the fuselage, and the many weighty items in this area necessitated such a length distribution.

Although the design changes attendant upon the employment of a tricycle undercarriage called for virtual redesign of the centre-section and front fuselage, in basic structural make-up the Hermes IV is essentially similar to the Hermes II and Hastings. Other new points are the employment of flexible fuel tanks, a high-pressure hydraulic system, a 12ov DC electrical system, complete air-conditioning and cabin pressurizing system, new small-bulk radio installations with the latest standard racking system, cloud and collision warning, magnesium-zirconium alloy castings for various items, and the new Graviner double-shot fire-fighting system. In terms of much of its equipment, the aircraft is as up-to-the-minute as it has been possible to make it. Thermal de-icing for the wings and tail surfaces would have been preferred, but, in relation to the production schedule, it was impossible to undertake the large amount of re-design and construction necessary for this, and B.O.A.C. therefore decided that B.T.R.-Goodrich pulsating rubber overshoes should be employed.

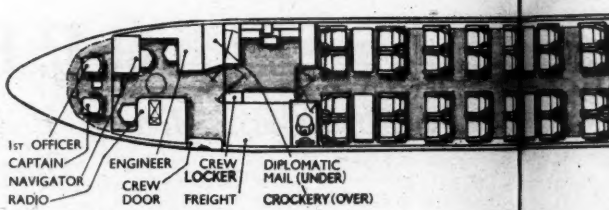
Since the structure of the aircraft is quite orthodox, there is little point in dealing with it in much detail. The fuselage is of circular cross-section with frames at 2oin pitch, and stringers are at 5 deg. angular separation. The cabin floor is ½in Plymax carried on beams spanning the lower arc of the fuselage, and Plymax is also used to form the floor and walls of the freight holds respectively fore and aft of the centre-section. It is worthy of note that the percentage structure weight of the fuselage is but 8.69 per cent of the gross weight. Horseshoe main frames at spar stations have spraddled feet to give a wide spacing (about 14in) for the pin joints through which wing/fuselage attachment is made. Incidentally, by virtue of the relatively wide separation, the high-tensile steel pins are only of ⅜in and ⅝in diameter.

Before going on briefly to consider the wings, it is worth-



HERMES IV . . . . .

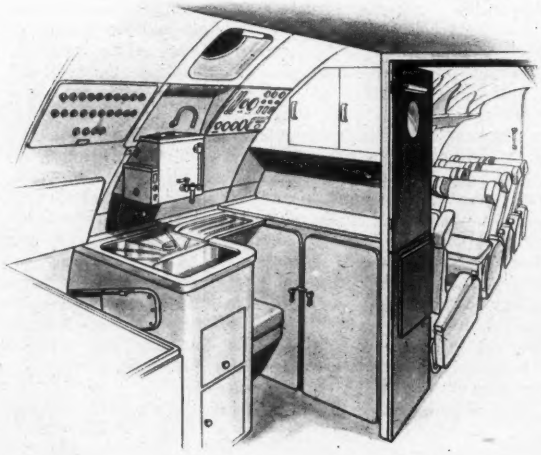
while to devote some attention to the fuselage pressurizing factors. Dry air sandwiches with silica-gel desiccant packs are used for the cabin windows and the pilot's windscreen, and the peripheral seals to the entry doors are of R.A.E. pattern. This employs a rubber membrane enclosing a space open to cabin pressure and closing against an edge of the door rebate, so that pressure differential will cause the membrane to swell and so provide an effective seal. The nosewheel retraction well is not pressurized, and, to "ease the strain," the sidewalls are curved so that a cross-section through the well has something of the appearance of a top-hat. Perhaps the most unusual aspects of fuselage structure in the pressurizing context are (i) the employment of a flat rear pressure bulkhead instead of the far more usual dome, and (ii) the complete absence of a front pressure bulkhead. The latter function is undertaken by the radome. This is an Onazote-Fibreglass-Nuron



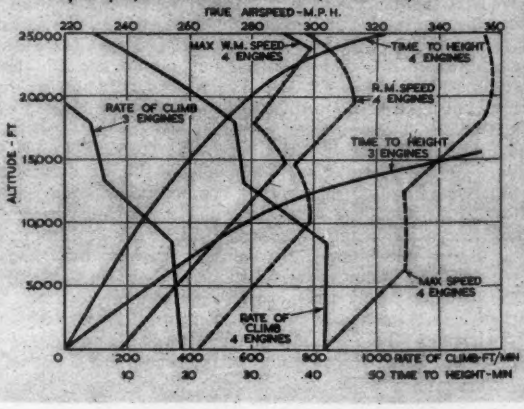
sandwich nosecap which encloses the cloud and collision warning radar equipment in the extreme nose of the fuselage. Certainly, the cross-section is circular, and thus stress distribution is equable, but, nevertheless, it does strike one as unusual that a plastic material, the chief characteristic of which is a low di-electric constant, should be up to the job of coping with a pressure differential of 5½ lb on every sq in of its internal surface.

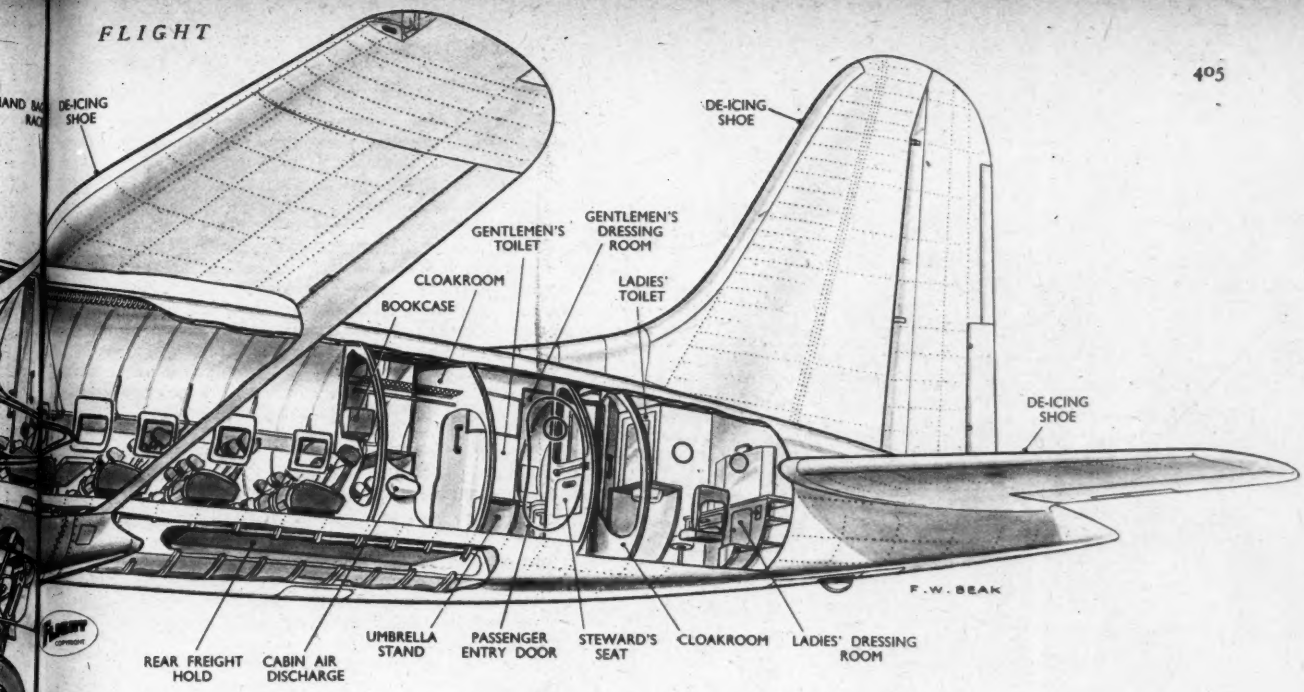
Wing structure comprises centre-section, intermediate wings and outer wing panels, but, although the centre-section and fuselage are built separately in the initial in-

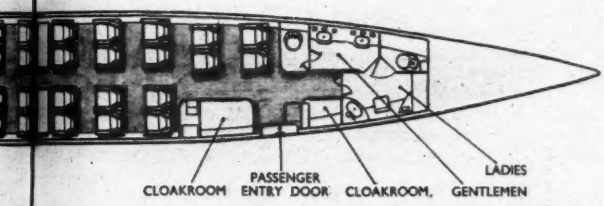
View looking from galley into forward cabin.



Curves of climb performance at 82,000 lb. (solid line) and of level speed performance at 78,000 lb. (broken line).







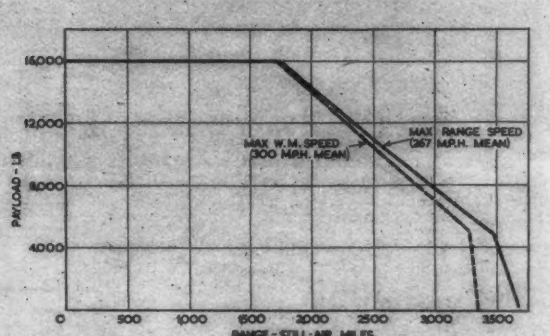
HERMES IV

Whilst in no way destroying the graceful lines of the aircraft, our artist, F. W. Beak, has succeeded in giving a good impression of the chief features which characterize the Hermes IV. The Bristol Hercules 763 fan-cooled low-drag power plants and the Electro-Hydraulics tricycle undercarriage are salient items, but in conjunction with the accompanying deck plan, the interior layout of accommodation, the underfloor freight holds, the crew quarters, galley and passenger services are clearly evident.

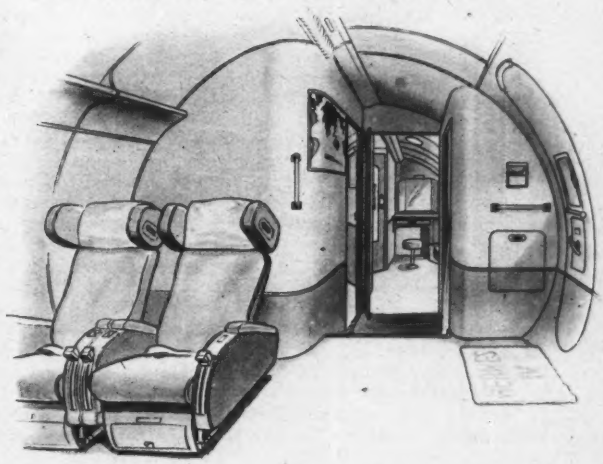
stance, the union is made quite early on, and the design is such that the centre-section and front fuselage can be considered as integral. Massive construction has always been characteristic of Handley Page aircraft and, although the design factor in the main is but 1.15 (the ultimate flight factor for gust cases at 82,000 lb is 4), examination of the wings does give one the impression of enormous strength. Two-spar structure is used throughout the wings, all spars, with the exception of the centre-section front member which is of girder truss form, being of diaphragm type. Inter-spar chordal ribs dividing the fuel tank bays are unusual in being spot-welded, twin-wall diaphragms. There are no fuel cells in the centre-section, the tanks being disposed in each rib bay of the intermediate planes and in the two inboard bays of the outer wing panels. The tanks themselves are Cimatrol flexible bag-type units by Fireproof Tanks, Ltd., with collector tanks below the inboard main tank, port and starboard. Each collector embodies a 400 gall/hr booster pump, and all fuel cocks are operated by electric actuators with position indicators on the flight engineer's control panel.

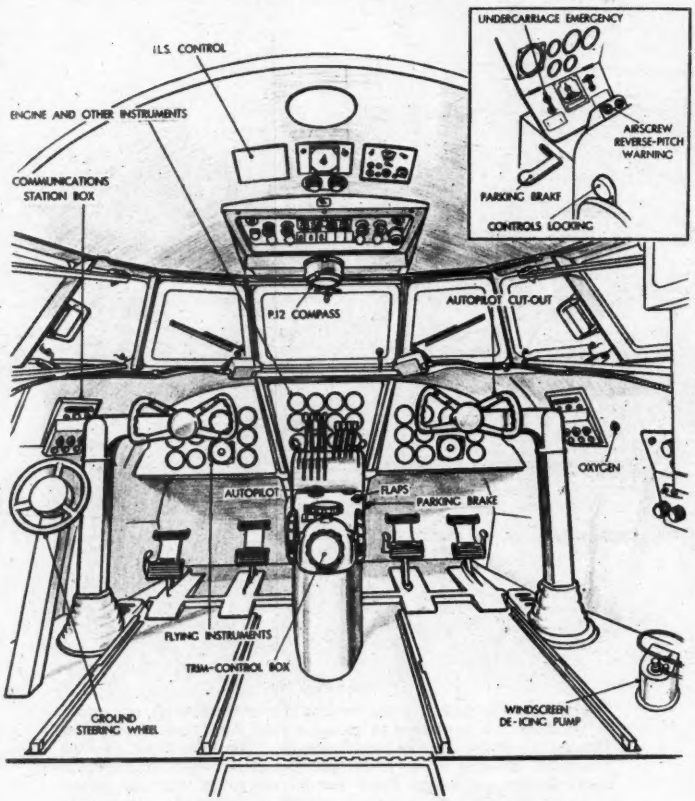
Whereas in the Hastings and previous Hermes aircraft, the main undercarriage was attached to the centre-section front spar, the tricycle layout of the Hermes IV required

Curves of range against payload at 25,000ft. for the 40-seat version with a basic empty weight of 53,137 lb.



View of entry vestibule and ladies' dressing room.





Detail of pilots' cockpit shown with seats removed.

HERMES IV . . . . .

the main landing gear to be moved rearward, and thus the undercarriage legs are pivoted in the base of huge forged posts bolted to the rear spar, so that the legs retract forward and upward. Dunlop twin-bag brakes are employed, and a twin-wheel layout is used both for the main gear and the nose leg. By using a common axle for both nosewheels, the anti-shimmy characteristics of the well-known twin-track wheel originally devised by Marstrand are obtained. This is not achieved at the expense of castering action, nor of steerability. In point of fact, the steering qualities of the aircraft are extremely good. Freedom is given to 90 deg. per side, the steering actuation being hydraulic with a rack and pinion final drive, and follow-up linkage back to the steering wheel to port of the captain's seat. The steering linkage can be said to be fully reversible in the sense that no means of disconnection is provided, and free castering action, or swing during towing, merely causes the cockpit steering wheel to rotate one way or the other. Undercarriage retraction and lowering is selected by push-buttons in the cockpit, and emergency lowering is effected by the conventional method of introducing compressed air to the jacks. The undercarriage units, in common with the 3,000 sq in hydraulic system, are the work of Electro-Hydraulics, Ltd., but the pumps used in the system are two Integral 116 units.

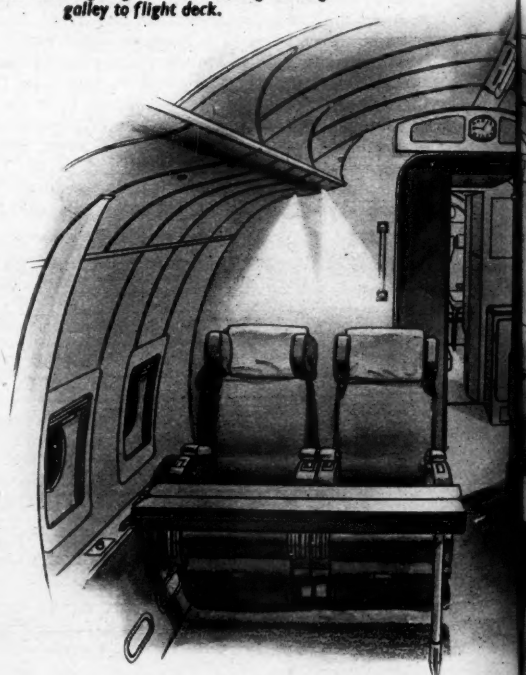
To return to the wings, the centre-section and intermediate wing panels are fitted with slotted flaps of a trifle less than 15 per cent wing chord, the flap/wing span ratio being 40.4 per cent, whilst 52.1 per cent of the wing area is flapped. Shielded Frise-type ailerons of 20 per cent wing chord are used, and of the twin tabs on each surface, the inboard are torsion-bar spring-balance tabs, whilst the outboard units are trimming surfaces operated conventionally from the cockpit. Spring-balance and trimming tabs are also used on the rudder, but elevators make use only of trimming surfaces.

Hercules 763 fan-cooled, low-drag power plants with cloverleaf cowlings comprise the power installation, the engines being carried on tubular triangulated mounting trusses from the front spars at the outboard ends of the centre-section and intermediate wing panels. Engine-driven Rotol accessory gearboxes furnish drive and mounting for the following components: two 30 lb/min Marshall cabin blowers on engines 2 and 3; two Rotax 30 kVA alternators on engines 2 and 3; two Hymatic H.Y.X. or S.H. 6/2A compressors on engines 3 and 4; three Eclipse H.I. compressors on engines 1, 2 and 4; and two Integral 116 hydraulic pumps on engines 3 and 4. Bloctube mechanical controls are used for throttle and c.s.u. settings, and electric actuators are furnished for supercharger change speed, master fuel cocks, master oil cocks and idler fuel cut-off, cowling gills, air intake shutters, oil cooler flaps, fuel tank cocks and fuel cross-feed cock. De Havilland constant-speed feathering and reversing airscrews of 13ft diameter are employed, and the leading edges of the blades are fitted with grooved rubber shoes for distribution of de-icing fluid from the slinger-ring surrounding the hub.

Whilst on the subject of power installation, mention should be made of the Graviner "second-shot" fire-suppression system. Each power plant contains one 12-lb and two 6-lb methyl-bromide extinguisher bottles, and the installation is such that the 12-lb bottle and one 6-lb bottle on an adjacent engine can be discharged into the spray rings of the engine on fire if additional extinction aids are required. Furthermore, provision is made for the automatic resetting of the flame-switches for second-shot indication. Crash-relay switches cause all bottles to discharge and also effect closure of the master fuel and oil cocks in the event of a crash landing.

Cabin atmosphere control in the most comprehensive sense is given in the pressurization and air-conditioning system. As already noted, the pressure differential is 5½ lb/sq in, which gives an equivalent altitude of 8,000ft in the cabin at a flight altitude of 25,000ft. The cabin air is conditioned for temperature and humidity in accordance with British Civil Airworthiness Requirements and pro-

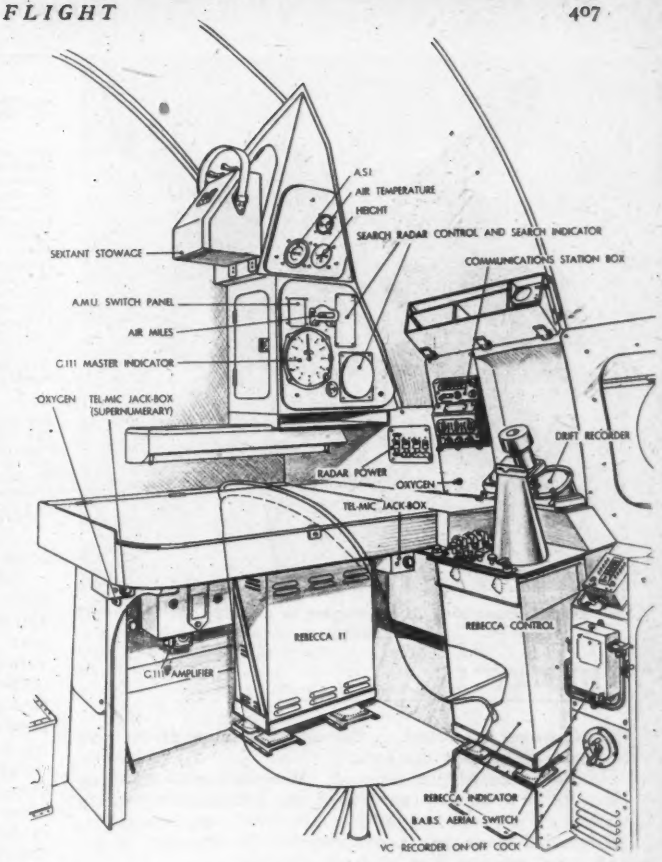
Night impression of forward cabin showing individual reading lights and looking through galley to flight deck.



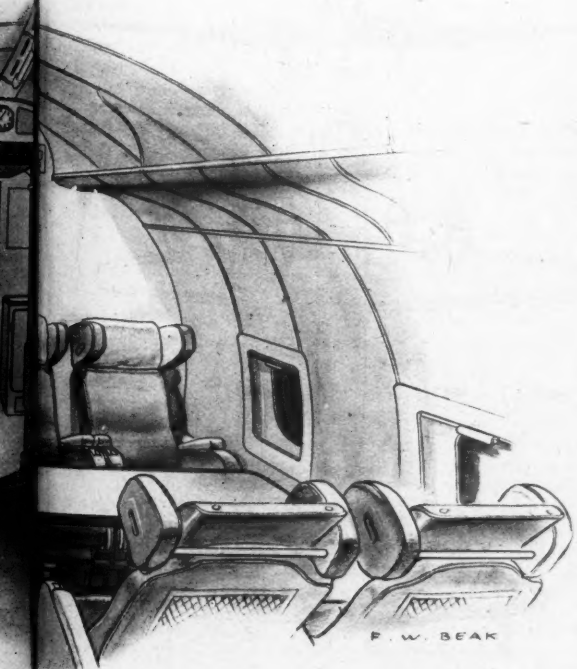
vides temperatures between 63 deg and 75 deg F, with relative humidity between 30 per cent and 70 per cent. Cabin air heating is effected through a heat exchanger on each inboard engine exhaust system which supplies hot *air* to a further heat exchanger which, in turn, heats the cabin air; there is thus no possibility of contamination. Incidentally, the under-floor baggage and freight holds are supplied with heated air to preclude any possibility of freezing in articles stowed there. Humidification is given by a Normalair humidifier, in which dry air is directed past a water jet by a swirl cone to give radial turbulence and assist evaporative action. The humidifier can also be used to reduce moisture content, the humid air passing through the body of the unit and precipitating a percentage of its moisture on the internal surfaces. The air finally passes out of the humidifier through a sieve cone and rectifier which retain unevaporated water. The main duty of air drying is, however, the province of a Marshall cold-air turbine unit which dries the air through partial refrigeration; this unit can also, of course, act as an air cooler when such treatment is required. The rate of air circulation throughout the cabin is 3 lb/min for each passenger and member of the crew.

Accommodation for the flight crew in the Hermes IV is as good as any we have yet seen. It is roomy, well laid out and should be a very comfortable work place. The Captain's and First Officer's seats are adjustable up and down, and for rake of back-rest, and are provided with folding arm rests and adjustable roll-type head rests; both seats run on rails, affording a fore-and-aft movement of about 12in to facilitate ease of access, and additionally have three locking positions at the forward end of the rails, so that, in conjunction with the adjustable rudder pedals, an optimum position for comfortable leg reach can easily be found.

Behind the Captain the radio officer sits facing aft at his control station, and the boon of the new miniaturized (what a word!) radio equipment is



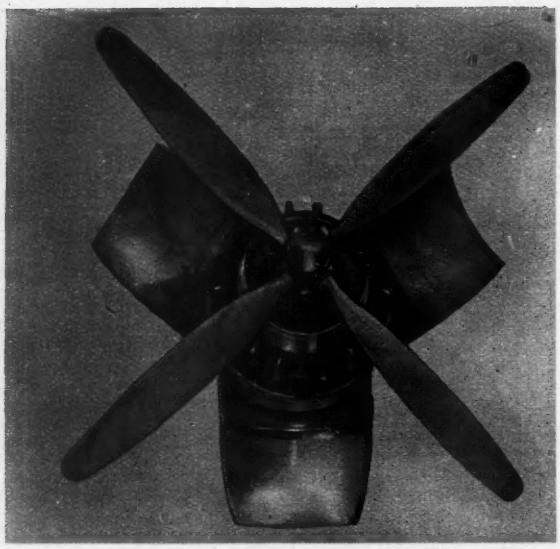
General detail of navigator's station showing the neat layout of instrumentation and radar equipment.



self-evident in the astonishingly small volume in which the various radio installations are installed. The radio equipment comprises S.T.R. 12 VHF communication; two HF transmitters and one MF transmitter, together with two MF/DF receivers (A.D. 108); A.D.F. radio compass installation; instrument landing system and O.R.B. reception installation; and, of course, WT 1907 intercomm. equipment. The navigator's station is to starboard opposite the radio officer, but facing forward behind the first officer, whilst the flight engineer sits back-to-back with the navigator and is faced by panels carrying the usual impressive array of engine and ancillary service instruments.

As a detailed description of the interior furnishings and accommodation for the aircraft was included in the August 19th issue of *Flight*, we do not propose to iterate the same information. Suffice it to say that the interior is reasonably well laid-out, as may be gathered from our main drawing and deck plan, and that the colour scheme chosen, a pink-beige wall and roof above a dado veneered in very light-toned Betula, down to a dark-beige carpet, accords well with the standard B.O.A.C. blue upholstery of the chairs. Dry-air sandwich rectangular windows are of quite generous area, although their pitch at 40in centre-to-centre does not fit in accurately with the pitch of the seats; it is, however, a much easier matter to adjust seat positions than to shift windows. In the soffit of the continuous racks, which form an effective division between roof and wall surfaces, are twin light-holes above each pair of seats. These are for individual reading lights and are cunningly arranged, in that each light throws only a narrow cone of illumination over its particular seat. In this manner, a passenger may comfortably read whilst his nearest fellow-traveller sleeps undisturbed by unwanted light.

The reading light switches are fitted on the dado shelf top, adjacent to the steward-call buttons. The steward-call system is by the Phœnix Telephone and Electric Works, Ltd., and when a passenger presses the call button it illuminates, at the same time illuminating the appropriate tell-tale in the galley. When



Maintenance accessibility to the engines is aided by the clover-leaf cowlings.

HERMES IV . . . . .

the passenger is served, a second depression of the call button switches out the light.

In the space at our disposal, we cannot give anything other than a cursory survey of the estimated operating economics for the aircraft. However, an exhaustive analysis of these has been prepared by Handley Page, Ltd., and we can thus abstract a précis.

For the Hermes IV cruising at 50 per cent take-off power, the total direct fixed costs are estimated at £60.38 per hour. A summary of direct operating costs and block-to-block speeds for varying stage distances, altitudes and flight speeds is given in the following table:

At 10,000ft at max. W.M. speed = 277 m.p.h. mean.
500 miles stage = 15.15d/ton mile at 200 m.p.h.
1,000 miles stage = 13.9d/ton mile at 218 m.p.h.
1,500 miles stage = 19.4d/ton mile at 226 m.p.h.
At 20,000ft at max. W.M. speed = 270 m.p.h. mean.
500 miles stage = 15.03d/ton mile at 189 m.p.h.
1,000 miles stage = 13.5d/ton mile at 208 m.p.h.
1,500 miles stage = 16.84d/ton mile at 220 m.p.h.
At 25,000ft at max. W.M. speed = 296 m.p.h. mean.
500 miles stage = 15.10d/ton mile at 197 m.p.h.
1,000 miles stage = 13.4d/ton mile at 220 m.p.h.
1,500 miles stage = 17.3d/ton mile at 237 m.p.h.

That the Hermes IV is an efficient aircraft is emphasized by the maker's claim that, at both 20,000ft and 25,000ft, a speed variation of 40 m.p.h. has little effect on the direct operating cost. Furthermore, the variation of costs with stage distance (i.e., actual mileages, not still-air ranges) of 500 to 1,500 miles is reasonably small, a factor which makes the aircraft particularly adaptable to routes of widely divergent characteristics. Perhaps the most remarkable quality of this aircraft's operational versatility is that, when flying at 20,000ft and approximately 260 m.p.h., efficient operation is given over stage distances within the remarkable range of 350 miles up to 2,000 miles.

The present order placed by the Ministry of Supply on behalf of B.O.A.C. is for 25 Hermes IVs, the first of which is to be delivered in the first week of January, 1949, and the remainder delivered at the rate of one in each succeeding week. Quite how long the Corporation will take over the necessary proving flights prior to putting the aircraft into scheduled service we do not know. However, we believe the B.O.A.C. are eager to get the Hermes into service, and there is every reason to hope that this will come about some time during the first half of next year.

Future developments of the Hermes, at present in progress, are a Mk V with Theseus turboprop power plants, and a Mk VI powered with (perhaps later marks of) the same Hercules 763 engines as used in the Mk IV, but with various important changes in airframe design. The Ministry of Supply have issued a development contract for two Hermes Vs and work on these is in hand. The Theseus power plants give 2,390 e.b.h.p. each for take-off, made up by 2,200 s.h.p, plus 590 lb residual thrust. The take-off weight will be increased to 84,000 lb, and among the design changes incorporated are pneumatically operated British Messier disc-type wheel brakes; combustion heaters in place of exhaust heat exchangers; electrical airscrew de-icing on the cyclic principle and, on the second aircraft, thermal de-icing to the wings and tail surfaces. The first Mk V is scheduled to fly in the spring next year.

On the Mk VI, which is a development of the Mk IV, the

(*Continued at foot of page 411.*)

HANDLEY PAGE HERMES IV

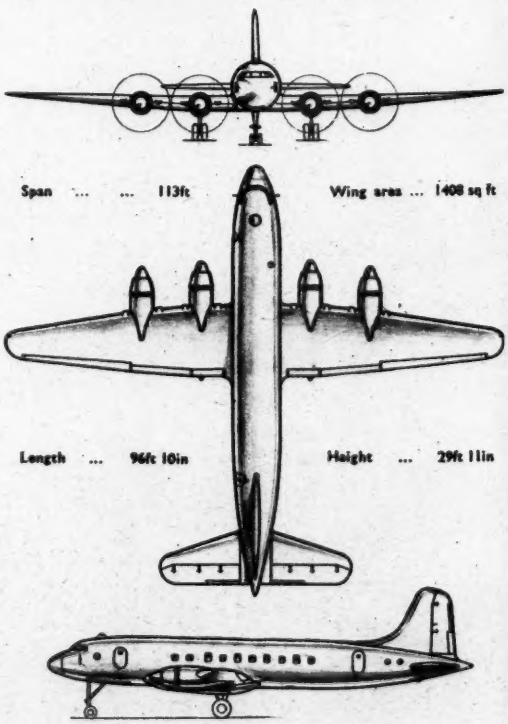
Four Bristol Hercules 763 Air-cooled Radial Engines of 2210 b.h.p. driving 13ft. Diameter D.H. c.s. Feathering and Reversing 4-Blade Airscrews.

Data

Wing aerofoil	N.A.C.A. 230 series
Dihedral	3 deg. 15 min.
Aspect ratio	9.08
T/c ratio at root	21 per cent.
T/c ratio at tip	6.7 per cent.
Tailplane span	43ft
T/p and elevator gross area	401 sq ft
Fin and rudder area inc. fuselage	239 sq ft
Fuselage diameter	11ft
Main u/c track mean	24ft 8in
Wheelbase	29ft 8.4in
Total fuel capacity	3,260 gall.
Total oil capacity	106 gall.
Take-off weight	82,000lb
Landing weight	75,000lb
Wing loading, take-off	58.24lb/sq ft
Power loading, take-off	9.28lb/h.p.

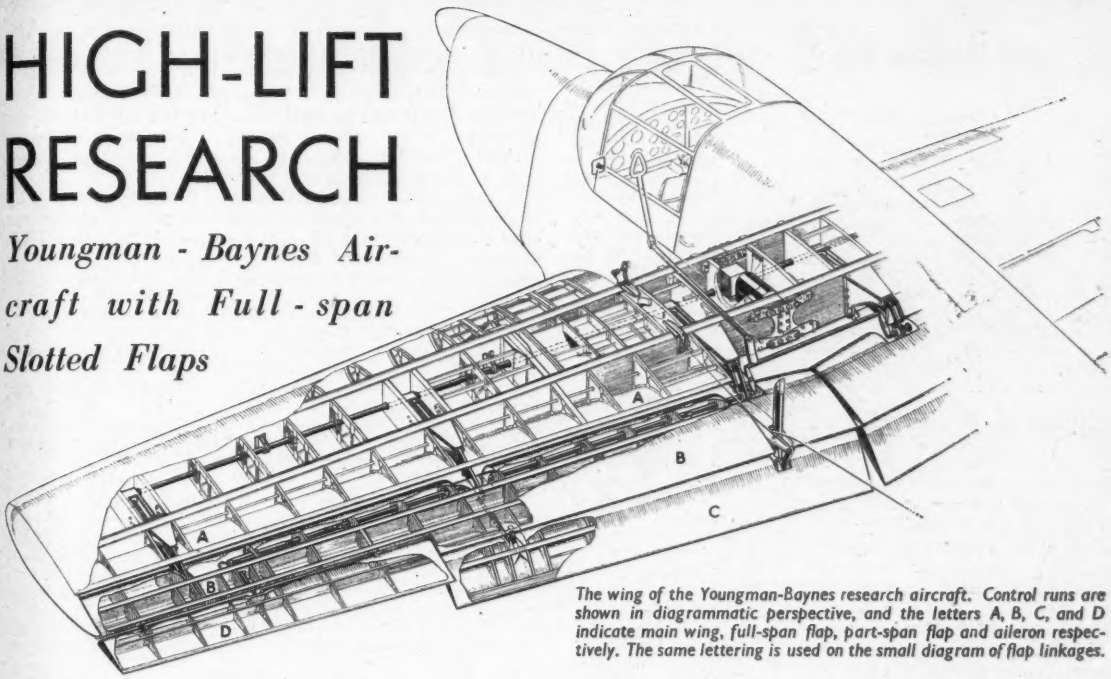
Performance

Max. speed	357 m.p.h. T.A.S. at 20,150ft
Max. R.M. speed	312 m.p.h. T.A.S. at 20,000ft
Max. W.M. speed	299 m.p.h. T.A.S. at 23,800ft
Rate of climb at sea level	1,275 ft/min.
T/o distance to clear 50ft	1,500 yds.
Distance to stop from clearing 50ft	1,415 yds.



HIGH-LIFT RESEARCH

Youngman - Baynes Aircraft with Full - span Slotted Flaps



The wing of the Youngman-Baynes research aircraft. Control runs are shown in diagrammatic perspective, and the letters A, B, C, and D indicate main wing, full-span flap, part-span flap and aileron respectively. The same lettering is used on the small diagram of flap linkages.

A GREAT deal of research has already been carried out on high-lift wing surfaces, and in order further to examine and test a full-span flap system, invented by Mr. R. T. Youngman, a research aircraft has been built by the Heston Aircraft Co., Ltd., to the design of Mr. L. E. Baynes, of the aircraft section of Alan Muntz and Co. This aircraft, which made a successful first flight on February 5th, is sponsored by the Ministry of Supply. The possibility of modifying a Proctor to carry the special wing was at first examined, but this proved impractical, and the Youngman-Baynes design built instead is a sturdy-looking low-wing cabin monoplane with slab-sided fuselage and rather large tail surfaces. Certain Proctor components have been incorporated, such as the windscreen, doors, tail wheel and some main undercarriage components. The undercarriage legs are somewhat longer than is usual to allow adequate ground clearance for the flap system when it is fully extended. The fuselage and tail units are of conventional ply-covered wooden construction, and the engine is a Gipsy Queen 32.

The slightly tapered wings, of semi-high-speed section, are of two-piece construction, their spars being bolted up to the lower fuselage members and joined, without centre section, at the aircraft centre line. Construction is of wood, with compressed-wood spar booms, spruce ribs and ply covering. However, the flaps are all of light alloy.

This high-lift wing follows earlier development work initiated by Mr. Youngman, and represented by the high-lift and brake flaps embodied on the Barracuda, Fulmar, and Firefly. The present scheme is derived from a Fleet Fighter design put up to the Admiralty in 1943 to facilitate take-off and landing on the restricted decks of the small slow-speed escort carriers.

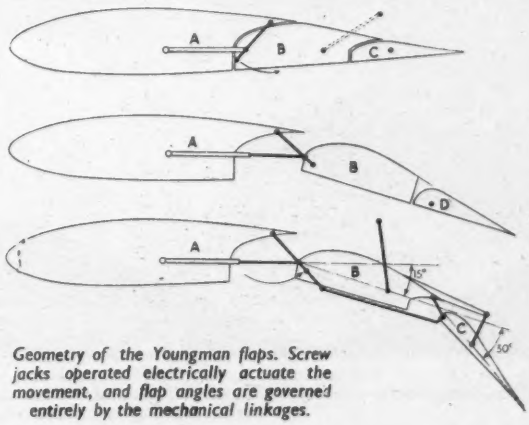
The Youngman high-lift wing combines full-span retractable aerofoil flaps and inset ailerons, with a second or auxiliary aerofoil flap spanning the inner portion of the wing. This arrangement provides the maximum possible lift coefficient consistent with the maintenance of full aileron control at slow speeds. The flaps occupy all that part of the wing aft of the rear spar, which is at 0.5 C.

From beneath the body the main flap extends to the wing tip and has a backward movement of 15 per cent of the mean chord. In the fully extended position the main flap in way of aileron (aileron neutral) provides a lift increment of 0.8 with the flap set at 15 deg to the main wing chord. The deflection of a 0.15 C aileron ±18 deg provides lift increments of +0.32 and −0.55 at a wing incidence of 16 deg. With the 0.20 C aileron fitted, the aircraft conforms fully with the specified requirements for lateral control at slow speed. It may be noted that this very satisfactory result is achieved by relying more upon rearward flap movement than upon large flap deflections for lift increment over the outer portion of the wing. There is also the added advantage of a much smaller adverse yawing moment.

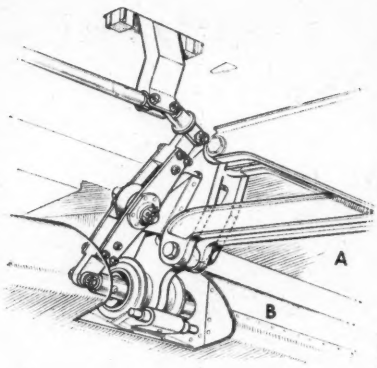
Lift Nearly Doubled

The auxiliary flap is 0.25 C and extends from beneath the body to the inboard tip of the aileron. It combines a backward movement of 7.5 per cent with an angular deflection of 45 deg relative to the main wing chord line. The combination of the main and auxiliary flap at 15 deg and 45 deg respectively provide a lift increment of 1.8. The overall lift increment for the complete aircraft assessed on the gross wing area flaps retracted is 1.5. Intermediate flap settings provide smaller increments at relatively high lift drag ratios for the take-off.

Structurally the flap and aileron operating mechanism is noteworthy for its simplicity. The main flap is supported by three shear links at its leading edge and one torque link under the body. The auxiliary flap is sup-



Geometry of the Youngman flaps. Screw jacks operated electrically actuate the movement, and flap angles are governed entirely by the mechanical linkages.



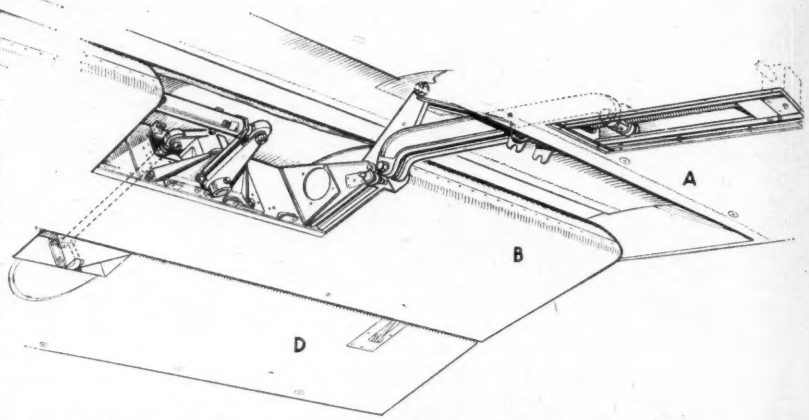
Actual physical mechanism of flap and aileron gear which is shown diagrammatically in another drawing. Lettering of different surfaces is the same as on the large key drawing. The linkage is such that aileron angle is independent of flap position.

High-Lift Research . . .

ported on two shear links and one torque link at its inner end. The main and auxiliary flap shear links are coupled together so that the latter is automatically operated by movement of the main flap. Although this arrangement necessitates the main flap being made torsionally stiff enough to carry its own load and those arising from aileron movement, the net result is an actual saving in weight and a great simplification of operating mechanism. The linkage is arranged in such a manner that the flaps are lowered during a combined downward and rearward movement.

Flap Operation

The flaps are operated by screw jacks connected to the front links. Motive power is provided by a standard accumulator and a 1½ h.p. electric motor which drives two high-speed shafts from a common central gear box. A bevel gear at each jacking point carries the drive to the screw jacks. This method of operation ensures complete synchronization of port and starboard flap movement. The energy required to lower or raise the flaps is less than 0.5 amp hours. Any one of three flap positions, Up, Half (take-off) and Down, can be selected on a gate-type control on the instrument panel. Incidentally, the first flight was made with flaps locked in the take-off position. Adjustable limit switches, accessible through panels, are operated by the port side flap torque arm.



Another special feature of the flap system is the very simple mechanical arrangement of the aileron controls, which have to transmit motion from the body or fixed part of the aircraft into the movable flap, and to compensate for the rearward flap movement without disturbance to the aileron setting. This is achieved by mounting on the inner front flap supporting link a lever which pivots in the plane defined by the pivotal axis of the link. The control rod coming from the stick is coincident with the upper or fixed pivotal axis of the link, and is attached to the lever by a universal coupling. Motion from the lower end of this lever, which is coincident with the movable pivotal axis, is transmitted to the aileron via a pull-push rod which passes through a hollow journal in the flap supporting link.

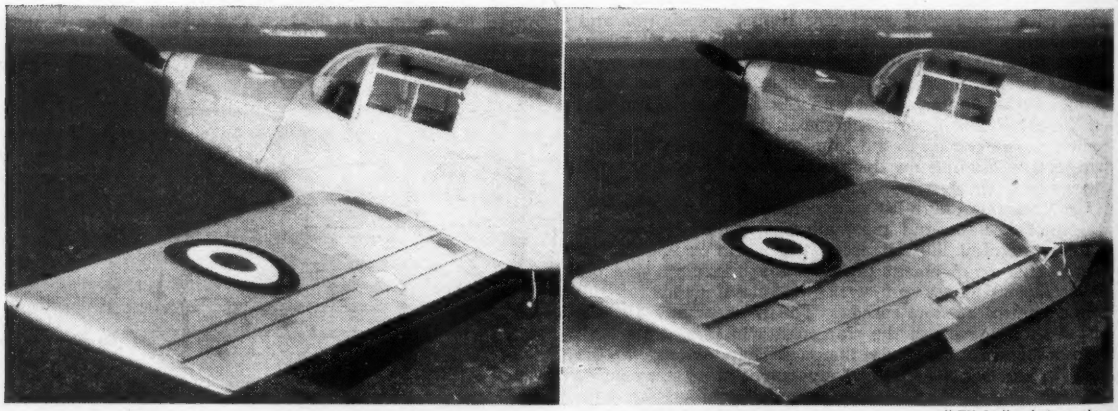
It may also be noted that the high-lift increment is achieved without recourse to extreme flap shapes. The lower leading edge of the flaps is square cut with the view to forming a clean aerofoil section when retracted. Tests show the loss of lift increment as compared with rounded leading edges is negligible.

So far as they have gone up to the present, the flight tests of the Youngman wing appear to indicate that the problems associated with the retention of full lateral and longitudinal control in conjunction with full-span flaps have been solved.

YOUNGMAN-BAYNES RESEARCH AIRCRAFT

D.H. Gipsy Queen 32 Engine

Span	33ft
Wing area	180 sq ft
Wing loading	20 lb/sq ft
Chord thickness at root	14 per cent
Chord thickness at tip	12 per cent
All-up weight	3,600 lb



"Flight" photographs.

The Youngman flaps in "up" and "down" positions. Note that the aileron is in neutral position in both cases, unaffected by flap angle. A photograph of the complete aircraft was published last week.

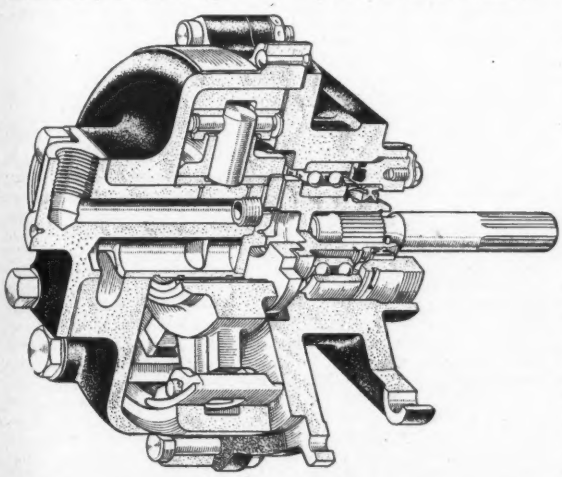
Fuel Pumps for Gas Turbines

Successful 500 Hour Non-stop Test Run Made on Petrol

REFERENCE was made in *Flight*, September 9th, to the possibility that, with the increasing use of gas turbines in aircraft, the demand for aviation kerosene may outstrip the production of this fuel. This possibility has led to investigations of fuel pumps capable of running on straight petrol so that, if the necessity should arise, gas turbines could be switched over to run on the same fuel as piston-engined aircraft or motor transport.

The experience of Dowty Equipment, Ltd., of Cheltenham, in the manufacture of hydraulic pumps of various types is well known, and this company has, for some years been at work on the special problems of fuel pumps. The announcement that the Fuel Pump Division of the Company, under the supervision of Mr. F. Carey, had recently succeeded in carrying out a successful 500 hour non-stop test run with a pump delivering straight petrol was made shortly before the S.B.A.C. show at Farnborough (*Flight*, August 19th).

The achievement of the Dowty fuel pump, Type 260Y Mark IV, in passing such a rigorous test, completed under A.I.D. supervision is principally remarkable in that no lubricant whatsoever was used either in the fuel or in the pump. The production of such a component is not only highly creditable technically but is also an important step in the advancement of gas turbine development. The actual performance figures of the petrol pump are of interest when assessing the merit of this official test-run. Throughout the trials the pump was run continuously at 3,500 r.p.m. for a period of three weeks delivering fuel at a pressure of 1,000 lb per sq in and at a rate of 650 gallons per hour.



A cut-away view of the Dowty Fuel Pump, Type A260Y. The splined drive-shaft, retained by a circlip, is readily detachable without dismantling the pump, in the event of it being damaged.

The pump incorporates seven radial pistons which reciprocate through a stroke of 0.58in in cylinders of 0.594in bore. The reciprocating action is produced by a stationary circular track ring, eccentric from the cylinder block, the latter being rotated by the drive shaft. Unlike the well-known live-line hydraulic pump, the track ring of the fuel pump cannot pivot about a knife edge or hinge, but is fixed so that its degree of eccentricity does not vary; thus the unit is a fixed rather than a variable delivery pump. Valving is by means of a central shaft or hub on which the cylinder block or star member rotates, containing ports through which liquid enters and leaves the cylinders. The dry weight of the complete unit is 11 lb.

Comparative figures for the A260Y fuel pump running on straight petrol and aviation kerosene respectively, show that the output on the latter fuel is slightly higher than on the former; these also show the delivery figures of the pump at different speeds:

Using 87-octane petrol, specification R.D.E/F/22, with no added lubricants, inlet pressure 3 to 5 lb/sq in; outlet pressure 1,000 lb/sq in.

Speed (r.p.m.)	Delivery (g.p.h.)
At 3,500	650
At 1,000	180
At 300	60

With a pump inlet depression of 12in of mercury, the delivery at 3,500 r.p.m. and 1,000 lb/sq in, is 580 g.p.h.

Using aviation kerosene, specification R.D.E/F/KER, inlet pressure of 3 to 5 lb/sq in; outlet pressure 1,000 lb/sq in.

Speed (r.p.m.)	Delivery (g.p.h.)
At 3,500	770
At 1,000	220
At 300	68

With a pump inlet depression of 12in of mercury, the delivery at 3,500 r.p.m. and 1,000 lb/sq in, is 700 g.p.h.

Further evidence of the reliability of Dowty fuel pumps was shown in the pump which was fitted to the de Havilland Goblin Mk. V during the military endurance trials successfully completed recently, reported in earlier issues of *Flight*. During this 500-hour test run the pump delivered a total of 136,000 gallons of kerosene at a pressure of 1,000 lb/sq in. The pump was calibrated for delivery both before and after the test, and the delivery was found to have dropped only 0.2 per cent from its original figure. This indication of how little the unit had worn was further substantiated when the pump was dismantled for inspection, the only sign of wear being minute scores on the thrust side of the valve member due to slight impurities in the fuel; the condition of cylinder and bores was virtually as new, as could be seen at the Dowty stand at the Farnborough display.

A further advance in the range of Dowty fuel pumps is a component which incorporates an overspeed governor and pressure control by-pass valve. Above predetermined speed centrifugal oil pressure generated by the rotation of the cylinder block deflects a diaphragm which opens a release valve; this operates a by-pass, thus reducing delivery to the engine.

HERMES IV *(Continued from page 408)*

most important change is in cutting down the basic empty weight by 2,000 lb, thus making this weight available for additional payload. Improved materials and the refinement of structural detail design are the methods by which this weight saving will be achieved. At present an all-up weight of 82,000 lb is envisaged for the Mk VI but, if Bristols can make extra power available from the engines, it is likely that the take-off weight will be increased to 84,000 lb. In comparison with those fitted to the Mk IV larger-chord shorter-span ailerons, and larger-chord greater-span flaps will be incorporated in the Mk VI. Shielded Frise-type ailerons will still be used, but flaps will be of double-slotted or eyebrow-slotted type. These modifications are designed to improve the take-off and stalling speed characteristics, and in order to maintain controllability at the lower safety speed derived from the lowered stalling speed, the fin and rudder area will be increased. Thermal de-icing and electric airscrew de-icing will be embodied as on the second prototype Mk V, but although British Messier disc-type brakes will likewise be used, their actuation will be hydraulic rather than pneumatic.

Naturally enough, all the lessons to be learned from operation of the Mk IV will be put to good use in producing the Mk VI, and although it would be precipitous to prophesy wondrous things for the Mk VI, it is, quite patently, a good aircraft and, moreover, an evidently sound, purposeful design which should go a long way toward silencing the too numerous traducers of our civil aviation capacity.

PILOTS' AND NAVIGATORS' LICENCES

AS from the date of introduction of the new I.C.A.O. licence examinations, the concession at present in force for the first and second class navigators' licence examinations, in which candidates are allowed six months to qualify, will be discontinued. Candidates for Flight Navigator, Airline Transport Pilot and Senior Commercial Pilot licences will be required to obtain not less than 60 per cent in each subject excluding signalling, 70 per cent of the total marks for all subjects, excluding signalling, and in signalling not less than 90 per cent. For full conversion all subjects must be taken in one examination.

Masefield's Sixteen Points

General Conclusions on Civil Aviation and Trends of Development

TO-NIGHT, Thursday, 30th September, at 6 p.m., the Fourth British Commonwealth and Empire Lecture (Some Economic Factors in Civil Aviation) will be given at the Institute of Civil Engineers, Great George Street, Westminster, by Mr. Peter G. Masefield, Director-General of Long Term Planning and Projects, Ministry of Civil Aviation.

This comprehensive paper will occupy almost entirely the October issue of the Royal Aeronautical Society's Journal, but in his delivered lecture Mr. Masefield will refer to the main points concerning the economic factors in civil aviation, with particular reference to operating standards and their relation to aircraft on the routes. He will refer also to the tooling and development costs of modern aircraft.

Mr. Masefield has set out to analyse the purpose of air transport, and examine its present status and economic position. He has also considered its commercial confines by setting up operating standards on which scheduled services must be built, and measures the progress made so far by assessing the trends of performance and economics achievable with present types of aircraft throughout the range of sizes, with examples from the Rapide up to the Brabazon I. The paper also projects these present achievements forward into the future in relation to potential new types of aircraft and power plants, and sums up the prospects in relation to the purpose of air transport, especially in terms of the service it can offer to mankind. The lecturer's conclusions are summarized by him in the following sixteen points:

POINT 1. Air Transport is a Good Thing, both nationally and internationally and the more of it, on sound lines, the better.

POINT 2. Air Transport is fundamentally a commercial business capable of being developed on sound economic lines but it has also important political, diplomatic, cultural, security and trading aspects.

POINT 3. Because of its several, non-commercial aspects some degree of subsidy is justified towards Air Transport in its formative stages. However, because subsidy is both internationally and commercially undesirable, leading as it does to national expenditure races and to concealment of operational inefficiency, **direct subsidies should be regarded as an expedient to be eliminated as soon as possible.**

POINT 4. The least pernicious and the most stimulating form of subsidy is "payment for services rendered," such as for the carriage of mails, so long as the total sum paid to the airlines does not exceed the total sum paid by the public—in the mail instance, in buying air mail stamps for air carriage. A weighted air mail rate according to route requirements will, in this way, serve to encourage the development of services and frequencies required in the public interest without drawing directly on the taxpayer's pocket.

POINT 5. Air Transport is essentially a business capable of becoming self-supporting when adequately developed with energy and enterprise. Provided that there are no international upheavals or economic slumps that stage should be reached during the next seven years. **Ten to twelve years from now Air Transport should have achieved a sound commercial status without subsidy on any route.**

POINT 6. Progress has to be made in three main directions: Aircraft and engines—improving performance and reliability. Air traffic control—eliminating congestion and delays. Business efficiency—reducing costs and overheads.

POINT 7. **Overheads are at present running at an average of between 40 and 70 per cent of total costs on the chief airlines of the World.** The figures obtained are in association with direct costs which are themselves inflated in relation to revenue. In line with other transport business, Air Transport overheads should be reduced so that they amount to not more than 33 per cent. of the total operating costs, or to some 50 per cent. of direct operating costs, which themselves should be reduced. This can be done. A substantial increase in the business efficiency of the airlines is thus both necessary and possible.

POINT 8. Air traffic control is costing some millions of pounds a year at present but is losing many more millions of pounds because air traffic has outgrown the control. Improved methods of air traffic control are essential. Indeed, turbine aircraft cannot be operated efficiently until that progress has been made. **The most hopeful direction for progress appears to be that of automatic landing** in all circumstances, the air crew and the ground scanners acting as monitors of the approach and landing. Until aircraft can be landed safely on individual runways in all weathers at a rate of not less than 30 per hour, the full realization of Air Transport cannot be achieved.

Cheap, fast, air transport, depends on the solution of the problems of air traffic control.

POINT 9. Aircraft development must lie chiefly in the achievement of increased speeds at lower costs by means of reducing aerodynamic drag and by means of improved fuel consumptions. The results of progress in these directions will be more revenue miles for the same utilization; more earnings for smaller expenditure. At the same time, delays and expenses covered by mechanical faults must be reduced far below their present high levels.

POINT 10. Engine developments for civil aircraft are of the utmost importance. Each of the various types of power plant—from the long-established reciprocating engine to the rocket of the future—has its sphere of maximum use.

(*a*) *The standard piston engine* is suitable for operations over all but the very long ranges. In the present state of the art, its most economic performance is gained at heights of up to 25,000ft., at speeds up to about 350 m.p.h. and, in present aircraft sizes, for stage lengths not exceeding 2,000 miles. One of its great advantages is its flexibility of performance within its economic speeds and heights.

(*b*) *The compound piston engine* is most suitable for very long range operation at moderate speeds and at greater heights than the piston engine. In contemporary sizes of aircraft it has advantages over the piston engine for stage lengths of more than 2,000 miles. For long ranges the compound piston engine gives promise of being even more flexible than the standard piston engine, for heights up to about 35,000ft. and speeds up to about 400 m.p.h.

(*c*) *The propeller-turbine engine* is, at present, most suitable for medium range operations at moderate speeds and heights—up to about 425 m.p.h. and 35,000 ft. When more fully developed for civil purposes, eventually, in conjunction with improved air traffic control, **the propeller-turbine is likely to show advantages over the piston engine for all but very short or very long range operations and—in the largest sizes—for all operations.** The chief difficulty with the propeller-turbine engine to-day is that because of the small amount of interest in it for military purposes, almost all the development costs have to be spread over relatively few civil orders. The propeller-turbine is, in consequence, not receiving the amount of effort which it deserves and only a fraction of the development which is being concentrated on the turbo-jet. The establishment of a strong Air Transport Command in parallel with civil airlines will greatly assist the development of new power-plants.

(*d*) *The plain jet engine* is most suitable at present for moderate ranges at high subsonic speeds and at great heights—not less than 450 m.p.h. at not less than 30,000ft. In the course of aeronautical development **the plain jet turbine will probably show improved commercial efficiency at supersonic speeds, up to about 1,500 m.p.h. at heights up to 75,000ft.** Although at high speeds the jet is more efficient than any propeller-driving engine, such speeds must always be costly to provide, although not necessarily less economic in operation because additional revenue may be attracted. In the immediate future **the jet engine appears unlikely to be worth while for distances of less than 300 stage miles or greater than 2,000 stage miles.** Its development beyond these confines will depend on the development of air traffic control to permit rapid landings.

(*e*) *The plain jet with after burning* is inefficient at subsonic speeds except as a take-off device. It is likely to prove suitable for cruising speeds of not less than 650 m.p.h. at 50,000ft and for supersonic cruising speeds of up to 2,000 m.p.h. at 80,000ft or more. The remarks on the plain jet apply with still greater force to the engine with "after burning" added.

(*f*) *The ram-jet* takes us, necessarily, into the almost unexplored realms of supersonic speeds, about which, one day, enough will be known to permit economic commercial operation.

When the time arrives **the most satisfactory operating speed of a ram-jet aeroplane would appear to be around 2,200 m.p.h. at 50,000ft** or more for stage lengths of around 1,000 miles.

(*g*) *The rocket power plant* applied to commercial aircraft is a further stage away. With it, speeds of up to 5,000 m.p.h. at not less than 100,000ft for stage lengths of some 500 miles appear possible. The economics at present look poor, but may improve materially as nuclear science advances.

(*h*) *The rocket projectile* is at the moment the ultimate peak of high speed transport to which we can look forward. **With theoretical intra-terrestrial speeds of up to 18,000 m.p.h., and inter-planetary speeds of 25,000 m.p.h., the rocket projectile may eventually bring any point of the earth's surface within an hour's block time of any other point—at an economic fare.** Although such prospects may sound fantastic, the progression to a service "On the Hour to Anywhere in the Hour" is no greater than that from the stage coach of yesteryear to the 300 m.p.h. transport aeroplane of to-day.

(I should add that my more detailed economic and performance explorations in this paper go no further than the plain jet.)

POINT 11.—Types and sizes of aircraft equally have their own most suitable spheres of use.

(*a*) *The commercial helicopter*, in sizes of not less than ten seats, will find its most useful application in stages of from 50 to 200 miles, particularly for journeys involving short sea crossings. At present, helicopter costs are likely to be a good deal more than costs of fixed-wing aircraft. But the helicopter is still at an early stage. Its development is likely to be rapid during the next ten years.

(*b*) *Short stage fixed-wing aircraft* are, in general, incapable of competing with efficient surface transport for distances of less than 200 miles except where sea crossings, mountains, or other geographical barriers intervene. From 200 miles onwards the aeroplane shows increasing advantages over surface transport—with the turbine offering possibilities of marked reductions in costs when the "stacking" problems have been solved.

(*c*) *Medium and long stage fixed-wing aircraft* represent the most advantageous developments in air transport vehicles. **Large aircraft are necessary for long stage routes.** But once the largest economic payload has been decided and allied to the longest route which requires to be operated, then every technical development will tend to reduce the size of aeroplane required for the job. At the present time aircraft of between 100,000 and 300,000 lb represent the peak of development for long stages. We shall probably see bigger types still before evolution begins to reduce the size.

POINT 12.—One of the most important factors contributing towards economic operations is the matching of aircraft size and types of aircraft to the routes and stage lengths over which they will be required to operate. In the present state of the art a 100,000 lb aeroplane is most suitable for stages of about 1,750 miles, whereas a 300,000 lb aeroplane is most suitable for stages of about 3,000 miles. For the same most economic stage distances and the same payload, turbine aircraft will have to be larger than aircraft powered with conventional engines until turbines consumptions have been improved very much compared with present prospects.

POINT 13.—Total annual operating costs vary in relation to three factors:—

(i) The fixed annual costs.
(ii) The hourly cruising costs.
(iii) The costs associated with take-off and landing.

They are influenced by the overheads, the number of hours flown in a year and by the stage length operated.

POINT 14.—**Direct operating costs are related to hours flown. Revenue is related to miles covered.** Therefore speed, so long as it is gained by development, is potentially economic even for short distances, not so much on account of the shortened journey time—which may not be significant—but because of the increased revenue earning capacity made possible for a given utilization.

POINT 15.—Ground costs are of major importance in the wider issues of air transport. Developments in airport runways, both in length and strength, have about reached an economic ceiling. **New aircraft must be designed to fit existing airports.** By taking advantage of methods of assisted take-off and by concentrating on multi-wheel undercarriages—later perhaps eliminating the undercarriage altogether—the difficulties can be met.

POINT 16.—The long-term trend of Air Transport is towards higher speeds at lower costs. Efficient operations, with advanced types of aircraft matched to the routes, hold out promise of economic costs no higher per mile than those of surface transport.

R.Ae.S. (BELFAST) PRESENTATION

THE annual general meeting of the Belfast branch of the Royal Aeronautical Society will be held at 7 p.m., in the College of Technology, on October 5th, 1948.

After the meeting, the branch prize will be presented to Mr. Gerald Moore, the successful student in Post Certificate Class in Aeronautics at the College of Technology, Belfast, for the Session 1947-48.

Following this there will be a show of films, loaned by the Ministry of Supply.

AIR-INDIA REPORT

AT the annual general meeting of Air-India, Ltd, on August 31st, in Bombay, Mr. J. R. D. Tata, chairman of the company, referred to the large increase in operations over those of the previous year. Expenditure had risen by 140 per cent over the previous year, due mainly to higher wage and salary bills, and a heavier provision for depreciation. Mr. Tata said that the company had been unable to reach the highest rate of efficiency in operations owing to the low load factor throughout India brought about by there being an excessive number of companies operating on a limited number of routes. Utilization figures were about 500 hours for each aircraft per year. After providing for taxation, and setting aside a sum of 3,200,000 rupees for depreciation and obsolescence and 100,000 rupees for reserve fund, the disposable profit was 947,354 rupees. A dividend of 6 per cent was paid on £900,000.

A. W. APPOINTMENTS: Mr. J. Lloyd (centre), Armstrong Whitworth's chief designer, now becomes Technical Director, with Mr. C. V. Murray, A.F.R.Ae.S. (left), as his assistant. Mr. H. R. Watson, B.Sc. (right), is appointed Chief Designer (Aircraft).

"PENETRATION" FIGHTER

ANOTHER new single-seat American jet fighter is undergoing trials at the U.S. Air Force's experimental base at Muroc, California—the MacDonnel XF-88, described as a "penetration" fighter, a term covering long-range strike or bomber-escort duties. Two Westinghouse 24C axial-flow turbojets are installed side-by-side in the fuselage with air intakes in the leading edge of the wing roots.

The wings and entire tail unit are of swept back and square cut configuration, and the pilot's pressurized cockpit, with ejector seat installed, is situated well forward of the leading edge. The XF-88 has a span of 40ft and length of 50ft. No details of performance are yet available, though appearance suggests that a speed well in excess of 600 m.p.h. is not unlikely.

R.Ae.S. CONVERSAZIONE

A CONVERSAZIONE will be held by the Royal Aeronautical Society on Friday, October 29th, from 8 p.m. to midnight in the Science Museum, Exhibition Road, South Kensington, by kind permission of the Director, Dr. H. Shaw. Members of the Society and their friends will be received by the President, Dr. H. Roxbee Cox, D.I.C., F.R.Ae.S., F.I.Ae.S., and Mrs. Roxbee Cox. During the evening aeronautical films will be shown in the Lecture Hall and for those who wish to dance a band will provide music from 9.30 p.m. to midnight. Refreshments will be served from 9 o'clock. Tickets, price £1 1s, include buffet and for student and graduate members double tickets cost £1 11s 6d, application should be made to the Secretary, R.Ae.S., 4, Hamilton Place, W.1, as early as possible, enclosing remittance.

New Cabin Blower Designs

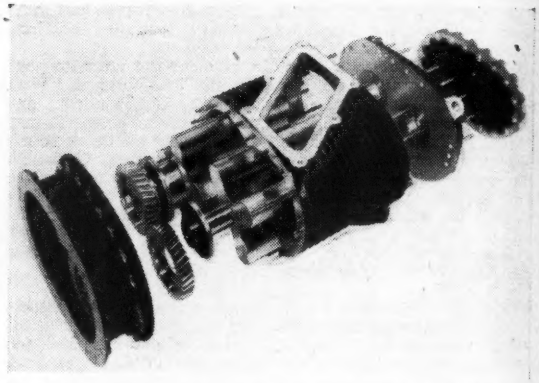
Efficiency of Roots Type Increased

WADE ENGINEERING, LTD., was formed by B. H. M. Winslett and Costin Densham to study the science of air compression and to design and produce compressors suitable for every application. During the last nine months the company has designed and produced a supercharger for use with various sizes of internal combustion engines. This design, moreover, incorporates new features which on test have been found to meet many of the problems which arise with the use of compressors for enclosed spaces, such as aircraft cabins, which require freedom from contamination.

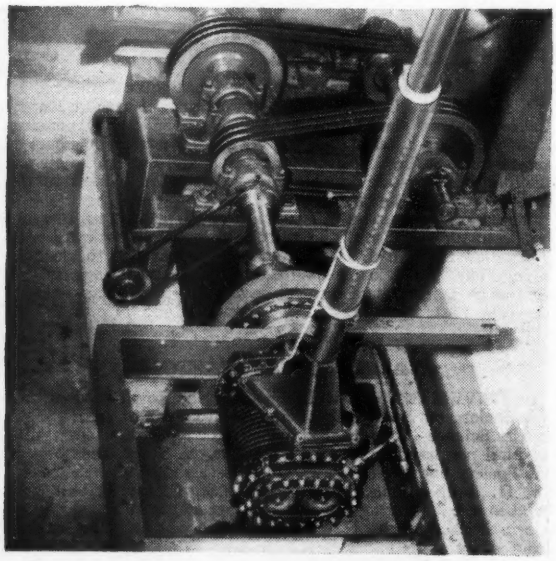
To solve so many problems at the first attempt was, perhaps, more than could be hoped for; nevertheless, the first model, a 1½-litre Roots type, withstood successfully the most searching tests on the company's own test-rig, and that model is about to undergo equally severe testing at the R.A.E., Farnborough.

Application of a normal supercharger to the requirements of a large aircraft fuselage was not actually included in the original design, but since such an application shows promise of being highly satisfactory on the score of efficiency, silence, and also low initial cost, a new air compressor has now been designed specifically for aircraft pressurization. This new design, which should defeat most of the deficiencies associated with the Roots and other types of blowers, has also been submitted to the R.A.E.E. It now remains with Farnborough to approve this design, which, if satisfactory, offers great advances beneficial to military and civil pressurized aircraft.

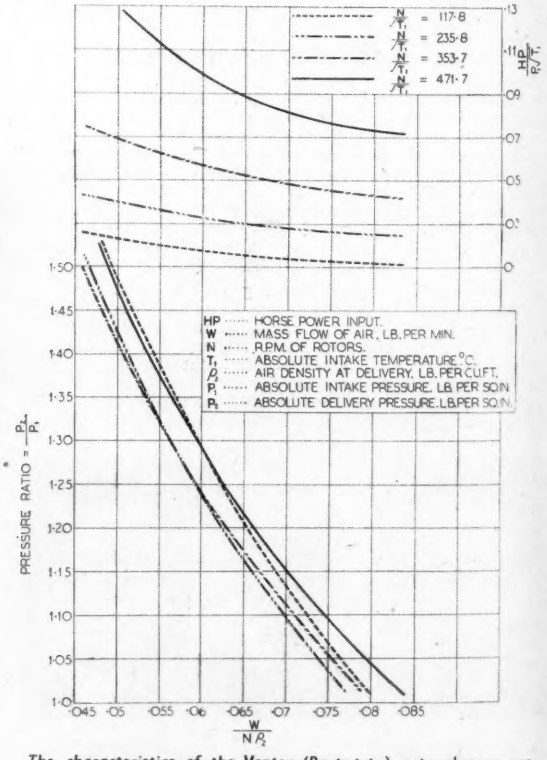
Stressed to withstand speeds up to 15,000 r.p.m., the 2-litre Roots-type blower now in production at Wade Engineering, Ltd., is capable of supplying pressures up to the equivalent of +7·10 lb/sq in with sea-level intake conditions. The rotors each carry four lobes, an interesting innovation in their design being the inclusion of special space-seals machined along the full length of the tips of the lobes. Thus slip losses between the tips of the lobes and the supercharger casing are reduced. The outlet port of the blower is of helical form across the delivery side of the casing, designed to reduce pulsation effect. In the case of a port running parallel with the rotor axes, which would be instantaneously uncovered along its whole length as each lobe reached the opening, "back-flow" takes place; in other words, the air under outlet chamber pressure flows momentarily back into the blower casing. The use of a helical port, however, allows the uncovering of the outlet by each rotor lobe to occur progressively, and pressure pulsations are therefore less intense. This feature contributes to more silent running, and an increase in overall



The Wade Roots-type blower is here shown with the end covers partially removed to show the bearings, oil seals and gears.



On this test-rig blowers are driven by a stationary engine through a step-up V-belt drive up to speeds of over 15,000 r.p.m. The blower is mounted on a cradle which is free to rock, enabling the test-rig to provide horse-power data as with a dynamometer.

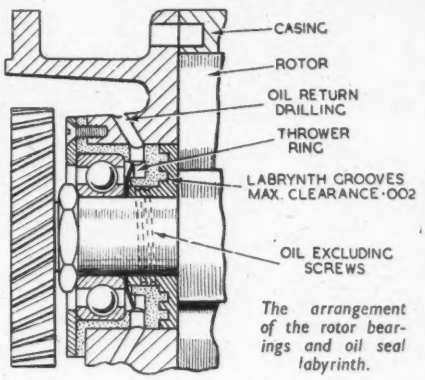

N/√T₁ = 117·8
N/√T₁ = 235·8
N/√T₁ = 353·7
N/√T₁ = 471·7
HP/ρ₁/T₁
HP ..... HORSE POWER INPUT.
W ..... MASS FLOW OF AIR, LB. PER MIN.
N ..... R.P.M. OF ROTORS.
T₁ ..... ABSOLUTE INTAKE TEMPERATURE °C.
ρ₁ ..... AIR DENSITY AT DELIVERY, LB. PER CU.FT.
P₁ ..... ABSOLUTE INTAKE PRESSURE, LB. PER SQ.IN.
P₂ ..... ABSOLUTE DELIVERY PRESSURE, LB. PER SQ.IN.
PRESSURE RATIO = P₂/P₁
W/NP₂

The characteristics of the Ventor (Roots-type) supercharger are here plotted in non-dimensional form, indicating mass output against H.P.

New Cabin Blower Designs . . . . .

efficiency of 5 per cent in operation is claimed. When used for cabin pressurization the reduction of pulsating effect, especially at low revolutions, is an important improvement. The same effect has, of course, been obtained in some designs by using helical lobes and a straight outlet port, but the production of such rotors was found to be expensive and their assembly intricate. The rotors of the Wade blower are machined from aluminium alloy die castings, and milled with a form cutter conforming to the correct shape of each lobe which is of modified cycloidal profile.

The two rotors are geared together by a pair of helical cut spur gears, one of which is of steel and the other of phosphor bronze; the use of dissimilar metal for the gears is designed to reduce wear and noise. For special applications where non-standard clearances are required, the final precision setting in mesh of the rotors (phasing) is achieved by shims placed between the gear wheels and their retaining faces. Small axial movement of a gear brings about slight relative rotation of the lobes by reason of the angle of the gear teeth.



The arrangement of the rotor bearings and oil seal labyrinth.

The importance of excluding oil from the blower chamber when operating cabin pressurization units has not been overlooked by the technicians of Wade Engineering. Great care has been taken in the design of the rotor oil seals to ensure that the air delivered is free from oil contamination, and to this end each bearing has three barriers between the oil feed lubricating the gears and bearings and the blower casing. The first of these is a thrower ring which slings oil outwards into an annular groove and so through drillings back to the outside of the bearing housing; the second barrier is a spiral groove which has the effect of "screwing" back along the shaft any oil that escapes the thrower ring; the final seal is in the form of a labyrinth consisting of three lands and three grooves machined to a maximum clearance of 0.002 through which any oil would have to pass to enter the blower chamber. The effectiveness of this assembly in retaining the oil only where it is required has fully satisfied the expectations of its designers. Incidentally, the two mating sections of the labyrinth made of steel and phosphor bronze are designed to serve as an emergency bearing in the event of a ballrace failure.

Whilst it is simple and effective, the Roots-type blower has the drawback that it cannot produce an inherent compression within itself, being more of a "windmill" than an actual compressor. For this reason the horse-power required to generate a desired cabin pressure is relatively high; i.e., the Roots blower cannot be said to be highly efficient for this purpose. Bearing in mind this inherent limitation and with the idea of reducing the horse-power required and increasing efficiency, the Wade design staff have evolved, and fully patented, a new type of blower which, though retaining the basic simplicity of a Roots-type blower, provides, by means of ingeniously designed rotors, an internal compression factor. Furthermore, by an equally ingenious method of "advancing" or "retarding" the location of the outlet port, the compression ratio can be varied at will. This should give the Wade "V"-type blower, as it is called, a great advantage over more conventional existing designs for cabin pressurization units. The port control mechanism can be coupled to an altitude-sensitive mechanism, which would regulate the output of the blower to suit varying altitude conditions. Furthermore, this would be achieved when running at constant, and most efficient, r.p.m., and the actual horse-power required to drive the blower would always be at the minimum figure. In fact the variation of compression ratio to cater for varying altitudes would eliminate much of the power wastage hitherto associated with conventional types of cabin blowers, and would also eliminate the necessity for variable-speed drives normally incorporated in centrifugal assemblies for pressurization. By its versatility this design should cater for many aircraft types with only a small range of sizes, an important production factor.

M.C.A. AIRPORT TRAFFIC

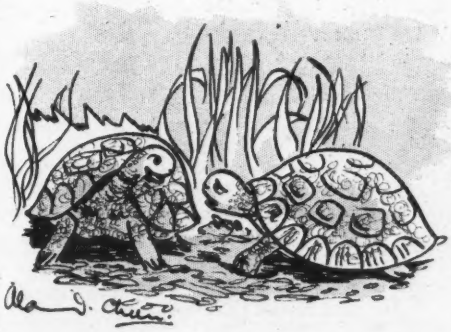
DURING July at Blackpool (Squire's Gate) there were 3,014 aircraft departures, of which 2,382 were pleasure flights. In the same month Northolt handled 61,277 passengers, involving 1,940 aircraft arrivals and 1,943 departures, of which 2,512 were by U.K. operators and 1,371 by foreign operators. In July last year Northolt was used by 43,571 passengers on scheduled services. Passengers from London Airport during July, 1948, numbered 40,040, involving 2,365 aircraft movements. Mail carried amounted to 599,938 lb and freight 1,235,654 lb. At Northolt during the month 393,551 lb of mail and 830,071 lb of freight passed through the airport.

Passenger and aircraft movements on regular scheduled services at other Customs airports in July, 1948, were:—

	Passengers	Aircraft Movements Arr.	Dep.
Renfrew	16,866	687	686
Isle of Man (Ronaldsway) ...	12,826	491	491
Belfast (Nutts Corner) ...	12,036	364	363
Liverpool (Speke)	10,734	405	406
Manchester (Ringway) ...	8,613	312	312
Prestwick	6,252	386	383
Southampton (Eastleigh) ...	4,780	204	204
Edinburgh (Turnhouse) ...	2,104	103	105
Cardiff (Pengam Moors) ...	2,060	241	241
Southampton Water ...	1,457	38	32

All aircraft movements, including regular scheduled services, charter, military, private, test and pleasure flights at some M.C.A. and Licensed airfields.

	July 1948 Arr.	Dep.	July 1947 Arr.	Dep.
Blackpool (Squires Gate) ...	3,014	3,014	518	519
Northolt	2,575	2,571	1,802	1,802
Southampton (Eastleigh) ...	1,801	1,806	1,842	1,839
London Airport	1,623	1,629	1,420	1,413
Croydon	1,369	1,376	2,088	2,126
Isle of Man (Ronaldsway) ...	1,199	1,199	1,151	1,152
Prestwick	1,096	1,101	805	801
Weston-super-Mare ...	956	957	1,538	1,538
Manchester (Ringway) ...	941	932	716	724
Renfrew	880	880	873	869
Lympne	873	861	1,064	1,068
Birmingham (Elmdon) ...	869	880	973	972
Nottingham (Tollerton) ...	852	852	371	371
Gatwick	845	863	—	—
Liverpool (Speke) ...	747	745	1,415	1,417
Yeadon	688	695	421	418



". . . . I suppose that would be just under Mach 0.0005."

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

MACH I PLUS

A Disclaimer

PLEASE!—I was not "primarily responsible for the design of the D.H.108," nor of any other aircraft (*Flight*, September 16th).

I am a keen foxhunter, a great lover of wild animals, not such a great lover of human nature, an enthusiastic Wagnerian, am more than ordinarily interested in aviation, and doubtless have a number of other vices; but I am not a designer of anything, and vehemently refute this allegation.

Furthermore, I am not connected in any way with a sometime wigmaker and fire-raiser, from whose ox, ass, and everything that is his I wholly dissociate myself.

Finally, my name is not Willie, and I equally dislike intensely being hailed by this name.

I am yours, irascible and somewhat exhausted,

Harpenden, Herts. RICHARD M. CLARKSON.

[We did not refer to Mr. Clarkson as "Willie."—ED.]

LONDON TRAFFIC CONTROL

What Will Happen When Jets Come Into Use?

FROM what little I have been able to gather from chatting to various people who have had actual experience of it, the present system of air traffic control for London Airport and Northolt seems to be somewhat cumbersome, although quite effective for the present air traffic conditions.

Presumably, there are advantages in having the South-Eastern Air Traffic Control Region centred at Uxbridge, and a separate Metropolitan area for aircraft to and from Heathrow and Northolt, but as the intensity of aircraft movements increases, and as speeds go up and up, it would appear that the "inertia" of so ponderous a control scheme as at present existing will prevent it keeping pace with both the volume and speed of the traffic it is designed to control. Furthermore, when gas turbines come into general commercial use, their voracious appetite for fuel will not permit leisurely orbiting until such time as Control can deal with them.

Doubtless these points are realized by the authorities, but no one to whom I have spoken on the subject has any ideas of the methods envisaged (if any) whereby the control system is to be modified to cope with the overall load.

Croydon. P. M. ANSON.

NOISE

A Selfish Outlook

FROM time to time a complaint is voiced by the inhabitants of some town or village that the noise of aircraft operating from a nearby airfield is troublesome and "ought to be stopped." One wonders whether the supporters of these complaints pause to think just what sort of action they are demanding. For every hundred people whose names appear on the complaints list it is probable that fewer than ten are genuinely troubled by the aircraft noise, that some twenty more are of the sort whose names appear on every such list, and that the rest weakly and thoughtlessly agree to inclusion. What they demand is, roughly speaking, the flying activities be transferred to another airfield where the noise would presumably bother other people—truly a most selfish suggestion; or that flying training should cease, which is absurd.

Those responsible for the control of flying have in the past been most reasonable and helpful. Where possible, without causing great inconvenience and expense of travel, airfields well clear of towns are used. Consideration is being given now to the external silencing of all airliners which must operate day and night from city airports, even though such silencing must inevitably result in reduced power and increased drag and weight, all of which, directly or indirectly, spell increased cost to the operator. Other local arrangements made to avoid discomfort to residents include the laying down of prohibited areas, minimum heights for flying, corridors, and airfield circuit direction designed to keep aircraft clear of towns whatever the wind direction.

The latest complaint about noise comes from certain residents of Woking, and concerns the local airfield, Fairoaks. Have these people, who are probably not representative of the town, any real cause for complaint? Ninety-five per cent of flights from Fairoaks are made by V.R. pilots under training in Tiger Moths. The largest aircraft to be operated from the field is the occasional Anson, the few others are small club and private-owner aircraft of the Tiger and Auster type. All these can be listed among the quietest to be seen in the air to-day. Moreover, right-hand circuits are flown when the wind (not the prevailing wind) necessitates a take-off direction and circuit over the heathland towards the outskirts of Woking. It should be remembered, too, that on Tigers it is usual to make an almost silent glide approach. Regarding the complaint of noise from night flying, this essential part of training is not carried out at week-ends, and only on occasional weekdays; moreover, it is almost always completed before midnight.

Even the most enthusiastic pilot would admit grounds for complaints about Harvards, submitted by the people of Grantham, for example. They had had more than their share of the shattering noise which on occasions seemed to fill the town as these aircraft took off from Spittlegate field on the hill bounding the town on the east side. There was rather less justification for complaints from Skegness in wartime concerning practice bombing at Wainfleet Sands at the top of the Wash. Woking has no real grounds at all, for the airfield was already there when many of the people moved into their homes, and, if anything, there has been a reduction in the volume of traffic in and out of Fairoaks. Let them be thankful that they do not have Croydon and Kenley to hem them in.

War is not yet just around the corner, it is still a full block away, but flying training and practice is essential. It might be that in the months to come, as once before, the people of Woking and other towns, far from cursing the noise of British aircraft, will "scarce forebear to cheer."

Ashtead. H. R. LEA.

R.A.F.V.R. AB *INITIO* TRAINING?

Use the Tiger Moths to Best Advantage

THE recent discussion in *Flight's* Correspondence columns on the merits of week-end Tiger Moth flying by pilots of the R.A.F.V.R. appears to have been conducted mainly from the viewpoint of the amount of personal pleasure involved. The more important aspect, the usefulness of such an occupation, seems to have been ignored to a large extent.

I cannot help feeling that experienced pilots can derive but small advantage from flying elementary trainers, and that the aircraft would be put to better use in giving initial instruction to suitable pupils, thus making available a reserve of at least partially trained pilots in the event of an emergency.

The recent relaxing of entry conditions for the R.A.F.V.R., by which ex-pilots who did not reach wings standard would be admitted, was a step in the right direction. If further concessions were made to admit suitable volunteers who were unable to become members of aircrew while serving in the Forces, there would be thousands of young men of 20 or 21 ready to undertake such training, and give up their spare time, particularly former members of the A.T.C.

Chertsey. "KEEN TYPE."

FORTHCOMING EVENTS

Sept. 30th.—Royal Aeronautical Society: Fourth British Commonwealth and Empire Lecture: "Some Economic Factors in Civil Aviation, with Emphasis on Civil Aircraft and their Prospective Trends of Development," Peter G. Masefield, M.A., F.R.Ae.S.

Oct. 6th.—Royal Aeronautical Society (at Birmingham): "Some Aspects of Power Plant Development," Dr. E. W. Still, B.Sc., A.F.R.Ae.S.

Oct. 8th.—Lancashire Aero Club: Annual Ball, Grand Hotel, Manchester.

Oct. 9th.—The British Interplanetary Society: "Interplanetary Man," Olaf Stapledon.

Oct. 13th.—R.Ae.S. (Hatfield): "Aircraft Photography," John Yoxall.

Oct. 15th.—Second International Air Ball at London Airport.

Oct. 16th.—Wolverhampton Aero Club: The Siddeley Trophy Race.

Oct. 21st.—Royal Aeronautical Society: "Cold Weather Operation of Aircraft," G. W. Wilson, A.F.R.Ae.S. and S/L. E.P. Bridgland, R.C.A.F., B.Sc., A.F.R.Ae.S.

Oct. 26th.—R.Ae.S. (Graduates and Students): "Flight Refuelling," Sir Alan J. Cobham, K.B.E., Hon. F.R.Ae.S.

Oct. 27th.—R.Ae.S. (Preston): "Design Problems of Large Flying Boats," H. Knowler, F.R.Ae.S.

LONDON LINE-UP: Bright September sunlight stresses the contrast between the Meteor and Vampire in sleek silver peacetime finish and their predecessors, the war-painted Spitfire and Hurricane farthest from the camera. The four fighters were on view in the Horse Guards Parade during Battle of Britain week.

Appointments

ACTING AIR VICE-MARSHAL F. J. W. MELLERSH, C.B.E., A.F.C., has been appointed Air Officer in Charge of Administration, Far East Air Command. A.V-M. Mellersh has been A.O.C. No. 21 Group, Flying Training Command, since May, 1947, before which he spent some eight months as A.O.C. No. 91 (Bomber) Group.

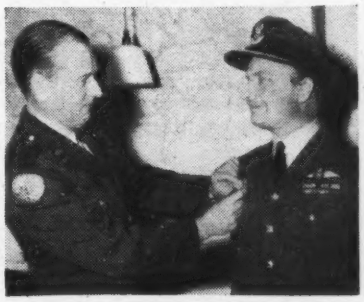
A. Cdre. W. J. G. Walker, C.B.E., is to be the Principal Medical Officer, R.A.F. Transport Command. Until recently, A. Cdre. Walker was P.M.O. of Fighter Command; before that appointment he spent two years as Deputy Director-General of R.A.F. Medical Services.

A. Cdre. H. V. Satterley, C.B.E., D.F.C., until recently Senior Air Staff Officer, British Joint Services Mission, Washington, has been appointed Assistant Commandant of the R.A.F. Staff College, Bracknell, Berkshire. Towards the end of the war A. Cdre. Satterley was appointed S.A.S.O. of "Tiger Force," which would have gone into operation against Japan but for the surrender. He was afterwards A.O.-in-C. Administration at Air H.Q., Burma, until August, 1946, when he went to the U.S.A.

R.A.F.V.R. Ground Enlistment Centres

AS we mentioned last week, recruiting is to begin on October 1st for the 17,000 men and women wanted for 36 ground trades in the R.A.F.V.R. Volunteers will at first be enrolled at eight Reserve Centres—No. 22 at Pucklechurch (Bristol), No. 23 at Titchfield (Fareham, Hants), No. 41 at Llandaff (Cardiff), No. 42 at Fazackerley (Liverpool), No. 44 at Castle Bromwich (Birmingham), No. 65 at Alvaston (Derby), No. 101 at Bishopbriggs (Glasgow), and No. 103 at Perth. It is hoped that recruiting will be opened at some of the remaining eleven centres later, though volunteers living too far from centres to train in the evenings or week-ends may still be accepted in certain trades for summer camp training, receiving a proportion of the yearly bounty.

Royal Air Force and Naval Aviation News and Announcements



At a recent ceremony at the U.S. Embassy G/C. E. M. Donaldson, D.S.O., D.F.C. was invested with U.S.A.F. pilot's wings by Brig. Gen. T. S. Power in recognition of services to the U.S.A.F. early in the war.

Devon Delivery

THE R.A.F. is now receiving a number of D.H. Devons in partial replacement of the Anson 19. They will be used by R.A.F. communication units at home and overseas. The Devon, an externally similar Service version of the Dove light transport, is powered by two Gipsy Queen 71 engines, cruises at 165 m.p.h., and carries eight passengers.

One of the first Devons will be flown to Iraq next month by A.V-M. J. N. Boothman, who has been appointed Air Officer Commanding, Iraq.

Meteors at Sea

PILOTS of the "navalized" Meteors which recently completed deck trials aboard H.M.S. *Implacable* were Lt. Cdr. Brown, Lt. Cdr. Kiggel, and Lt. Orr. Thirty-two successful landings and take-offs were made, and the average length of run before "unsticking," against a wind of approximately 44 m.p.h., was 380 feet. The aircraft were flown to the carrier from Thorney Island, completed the trials, were refuelled, and returned to base. Photographs of the trials appeared in *Flight* of Sept. 2nd.

R.A.F. Regiment in Action

AIR VICE-MARSHAL A. C. SANDERSON, C.B., C.B.E., D.F.C., Air Officer Commanding, Malaya, praised the work of the first two squadrons of the R.A.F. Regiment (Malaya) when he visited a training base at Sembawang recently. He said that No. 91 Squadron were operating in Johore against Communist bandits and had been doing magnificent work. "I have had letters from senior Army officers telling me what

Service Aviation . . . . .

valuable work this unit is doing in their commands," he added. "No. 92 Squadron is protecting airfields in Malaya. I have watched them at this task, and they are first class."

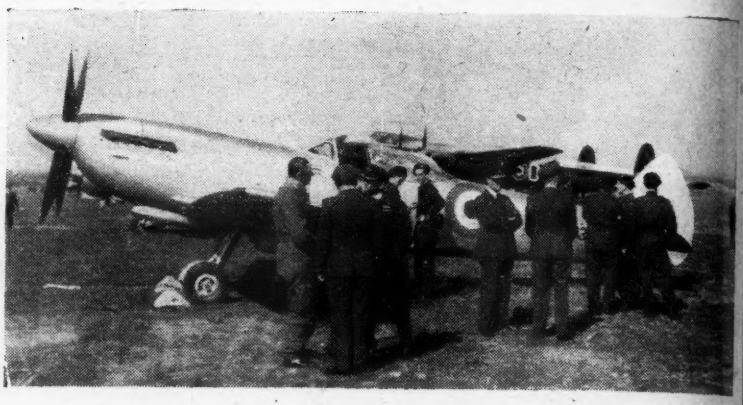
A.V-M. Sanderson inspected two new squadrons, Nos. 93 and 94, which are now under training, and congratulated them on their turn-out, saying that the R.A.F. Regiment (Malaya) was a body of which the Royal Air Force would be justly proud.

Felixstowe's Open Day

INCLUDED in the static exhibition inspected by over 4,000 visitors to Felixstowe's "At Home" was the complete Saunders-Roe stand from Farnborough. Though grounded by float damage, the Short Seaford flying boat was the object of considerable interest throughout the day, and people were queueing to inspect its interior even after "closing time." Apart from a Felixstowe Sunderland and Sea Otter, visiting aircraft took part in the flying programme, including Meteors from Horsham St. Faith.

Felixstowe has been the home of the Marine Aircraft Establishment since 1924, except for a temporary transfer to Helensburgh, Scotland, from 1939-1945, and is thus responsible for research on all water-based aircraft used by the R.A.F., the prototypes of which are sent to Felixstowe for performance trials. Similar tests are made on civil flying boats and amphibians before issue of Certificates of Airworthiness. A considerable amount of development work on safety equipment, including dinghies and airborne lifeboats, has also been done by the Establishment. Aircrews and maintenance personnel at Felixstowe belong to the R.A.F., while the Ministry of Supply provides the civilian research staff responsible for organizing, observing and analysing experiments.

Air Chief Marshal Sir John Slessor, principal Air A.D.C. to the King, arriving at Westminster Abbey for the Battle of Britain Thanksgiving Service on Sunday, September 19th.



FLYING VISIT: A.V.-M. Sir William Elliot, A.O.C. Fighter Command (in flying suit) chatting with the C.O. of R.A.F. of Thorney Island, G/C. Eeles, before returning to Uxbridge in his Spitfire. A.Cdre. the Earl of Bandon, Commandant of the Royal Observer Corps, is standing in front of the Spitfire's fuselage roundel. The A.O.C. had flown to Thorney Island to address members of the R.O.C. camping there.

Naming Ceremony

ON October 8th, at Guildford Station, the Lord-Lieutenant of Surrey will perform the ceremony of naming one of the Battle of Britain class engines, "No. 615 (County of Surrey) Squadron." The Battle of Britain engines are 4-6-2 locomotives weighing 80 tons each and developing a tractive effort of 31,000 lb at 85 per cent boiler pressure. This makes an interesting comparison with the Rolls-Royce Griffons fitted to the squadron's Spitfire 21s, which develop 2,035 h.p. for a weight of only 2,090 lb.

Filton Handicap Race

SIX aircraft competed in a handicap race over two laps of an 18-mile course during 501 (County of Gloucester) Auxiliary Squadron's "At Home" held at Filton on Sept. 18th. S/L. R. M. Veal came in first in 15 minutes, flying an Anson; a Tiger Moth flown by S/L. C. R. Cubbit was second in 21½ minutes. The remaining places were taken by a Proctor, Spitfire 14, Auster 5, and Harvard.

15,000 More Observers Needed

THE Secretary of State for Air, Mr. Arthur Henderson, addressed members of the Royal Observer Corps holding their first camp, when he visited Thorney Island on September 18th. Mr. Henderson said that one of the lessons already confirmed by the recent air exercises was that the human eye, the human ear and the human brain, allied together in the shape of a fully trained member of the R.O.C., could play a part in the detection and recognition of the fastest types of modern aircraft which could not be accomplished by any other means. Referring to the strength of the Corps, the Secretary of State said that there had been a steady increase from 9,000 in January, 1947, to 13,000 last month, but that the Government wanted the total to reach 28,000 men and women as soon as possible.

Permanent Commissions

GENERAL DUTIES BRANCH

Wing Commanders: J. L. Barker, C.B.E., D.F.C., J. B. Coward.
Squadron Leaders: D. R. M. Frostick, G. W. Garton.
Flight Lieutenants: D. J. P. Broomfield, D.F.M., P. C. Buchanan, P. W. Ellis, D.F.C., B. C. Horsnell.

SECRETARIAL BRANCH

Wing Commanders: K. W. C. Bindloss, R. K. Brougham, F. E. Frayn, M.B.E., J. H. G. Sarll, D.F.C.
Squadron Leaders: R. A. Craigie, H. J. Heal, D.F.C., A. W. Jones, W. R. Morris, A.F.C., G. W. Swanwick, J. S. Tucker, C. B. Wright.
Flight Lieutenants: D. W. Bryant, D.F.C., G. Cubby, S. E. Emberley, M. E. Gardner, H. B. Glover, W. J. Hurlock, L. E. S. Whaley, D.F.C.
Flying Officers: R. Hills, R. V. H. Kain.

Short Service Commissions

GENERAL DUTIES BRANCH

Flight Lieutenants: D. H. Darney, L. R. Reid.
Flying Officer: R. H. Kerswell.

TECHNICAL BRANCH

Flying Officer: K. G. Nichols.

EQUIPMENT BRANCH

Flight Lieutenants: G. E. Andrew, J. Watson.

SECRETARIAL BRANCH

Flight Lieutenants: H. H. A. C. Locke, W. D. Starr.
Flying Officers: P. L. Gorringe-Smith, F. R. Pepper C. A. Sherwood.

PHYSICAL FITNESS BRANCH

Flight Lieutenant: G. W. Edmonds.

Reunions

NO. 269 SQUADRON OLD COMRADES' ASSOCIATION will hold its third annual reunion dinner on Dec. 4th at Stewart's Restaurant, 50, Old Bond Street, London, W.1. All correspondence to Hon. Sec., F/L. M. R. B. Clift, A.F.C., 16, Bellevue Rd., London, N.11.

* * *

All ranks of the R.A.F. who served at Headquarters No. 216 Group are invited to a Reunion at the Café Royal, Regent Street, London, W.1, at 19.15 hours on Saturday, October 30th. Full details and tickets can be obtained from W/C. R. McLean, 78, Buckingham Gate, S.W.1 (Tel.: Whitehall 2491).

* * *

There will be a reunion dinner for officers of No. 84 Group Dinner Club at Simpsons in the Strand, London, W.C.2, on Oct. 4th at 7 o'clock for 7.45. Tickets 19s 6d from Hon. Sec., D. L. McDonnell, O.B.E., 2, Hare Court, Temple, E.C.4.